LS Automation Solutions Otomasyon Sistemleri A.Ş.

LIFTONE

USER MANUAL

CE

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This operation manual is intended for users with general knowledge of electrical theory and installation for the lift/elevator operation. Ensure that the end user and the maintenance technician receive this user manual.

Safety Information

Read and follow all safety instructions in this manual precisely to avoid unsafe operating conditions, property damage, personal injury, or death.

Safety symbols in this manual

⚠ Danger

Indicates an imminently hazardous situation which, if not avoided, will result in severe injury or death.

⚠ Warning

Indicates a potentially hazardous situation which, if not avoided, could result in injury or death.

⚠ Caution

Indicates a potentially hazardous situation which, if not avoided, could result in minor injury or property damage.

Safety information

⚠ Danger

- Do not open the cover of the equipment while it is on or operating. Likewise, do not operate the LiftOne while the cover is open. Exposure of high voltage terminals or charging area to the external environment may result in an electric shock. Do not remove any covers or touch the internal circuit boards (PCBs) or electrical contacts on the product when the power is on or during operation. Doing so may result in serious injury, death, or serious property damage.
- Do not open the cover of the equipment even when the power supply to the LiftOne has been turned off unless it is necessary for maintenance or regular inspection. Opening the cover may result in an electric shock even when the power supply is off.
- The equipment may hold charge long after the power supply has been turned off. Use a multi-meter to make sure that there is no voltage before working on the LiftOne, motor or motor cable.
- Supply earthing system: TT, TN, not suitable for corner-earthed systems.
- Wait at least 10 minutes before opening the covers and exposing the terminal connections. Before starting work on the LiftOne, test the connections to ensure all DC voltage has been fully discharged. Personal injury or death by electric shock may result.

⚠ Warning

- Do not install this equipment on or near combustible material. Doing so may cause a fire.
- This equipment must be electrically grounded for safe and proper operation.
- Do not use or supply power to a faulty LiftOne. If the LiftOne is faulty, disconnect the power supply and arrange for qualified technical support.
- The LiftOne will become hot during normal operation. To avoid burns, do not

touch the LiftOne until it has cooled.

- Do not allow foreign objects, such as screws, metal filings, debris, water, or oil to enter the LiftOne. Foreign objects inside the LiftOne may cause the LiftOne to malfunction or result in a fire.
- Do not touch the LiftOne with wet hands. Doing so may result in electric shock.

ⓘ Caution

- Do not modify the LiftOne. Doing so will void the warranty.
- The LiftOne is designed to operate 3-phase motors. Do not use the LiftOne to operate single phase motors.
- Do not place heavy objects on top of electric cables. Doing so may damage the cable and result in electric shock.

Table of Contents

1 EN81-20 Standard

1.1 EN81-20 Standard Safety Warnings in Elevator Equipment and Installation

- In control and safety circuits, the effective value of the voltage between conductors or between the conductor and the ground or the average value of direct current must not exceed 250V. The neutral conductor and the protective earthing conductor must always be laid separately.
- LiftOne's main power (PE,N,L1,L2,L3), main motor's power (U,V,W,PE) and shaft lighting (4F,N4) cables should fulfill requirements mentioned in EN 60204-1:2006's table 5.
- The distance between the control panel and the electrical distribution panel (EDP) should be no more than 1 m. In cases where this cannot be achieved, a switch should be installed in 1m distance, which can cut off input phases of LiftOne and if present the backup supply phase (L1, L2, L3, N and L1 and N of backup power).
- If some parts of one of the group-controlled elevators are under power when the main switch is turned on, they should be able to be cut off with a separate switch when necessary.
- The lighting feeds and circuits of the cabin, shaft, engine room and control cabin must be independent of the main supply phase and circuits. (5.10.7.1) These circuits shall not be affected by faults of the main supply circuit.
- During the movement of the cabin in the shaft, there should be a permanently installed lighting system in the shaft that will provide lighting in any position of the cabin. (5.2.1.4.1)
- There should be a permanently installed lighting system with a density of at least 200 lux for the required operation in the machine areas, machine room, anywhere at the floor level and at least 50 lux for the movement of the cabin between the working areas. (5.2.1.4.2)
- In order to prevent the cabin from moving in the event of an overload, a contact or sensor that senses the overload and outputs +24VDC to the 804

input must be used. When the cabin is overloaded, an output of +24VDC is electrified from output 01 and this signal is used to activate the audible and visible warning in the cabin. (5.12.1.2.1) In case of overload, the automatic doors are fully opened, the doors are not locked, the level correction in hydraulic elevators is not canceled.

1.2 EN81-20 Standard Safety Warnings in Revision Operation

1.2.1 Cabin Top Control (Maintenance) Box (5.12.1.5 EN81-20:2020)

When the maintenance switch on the cabin is on (its contacts interrupt the circuit), the 869R signal is interrupted and maintenance operation begins.

- When performing maintenance via Cabin Top Control Box :

1) Manual control (Revision control switch) must be disabled from the panel. For this purpose, the connections of the revision switches and buttons must be connected as shown in the diagrams provided by LS AS.
2) Since the voltage at the 869R pin will be in off state, normal operation will be disabled by the LiftOne device due to the safety circuit being interrupted and calls will not be accepted.
3) The movement of automatic doors is blocked.
4) The cabin lamp is kept lit by the control system.
5) Emergency stop and safety circuits are active. (They must be connected in accordance with the schemes)
6) The user must ensure that the cabin speed does not exceed 0.63 m/s. (It is supposed to be mentioned which speed this is)

7) The cabin must be prevented from traveling beyond the normal limits of movement.

8) If the distance between the cabin ceiling and the shaft is less than 2 meters, the cabin speed should not exceed 0.30 m/s. To achieve this, the control system travels at revision speed up to the 817 and 818 mandatory decelerator switches and stops when the 817/818 signal is interrupted. The movement of the cabin can be continued up to the lowest or highest floor level. To continue the movement, the user must release the movement button of the direction cabin going and press it again. In this case, the movement of the cabin continues at a speed of 0.30 m/s until the 820 switch is cut off. After the 820 switch is off, the cabin speed is reduced to the docking speed and the movement continues until the floor level. (If there are no 820 switches in the system, the movement continues at the docking speed up to the floor level.)

9) A return to normal operation is only possible if the maintenance switch is switched off. If the voltage at the 869R input pin remains in ON state, the elevator cannot switch to normal operation.

10) Priority of control

① Shaft Pit Box

② Cabin Top Control Box

③ LiftOne Re-Call Mode

1.2.2 Manual control from the panel (Re-Call Control) (5.12.1.6 EN81-20:2020)

When the “normal operation/manual re-call” selection socket in the panel is in the re-call socket, manual re-call control operation is enabled from the panel. In case of this control mode, the electrical safety contacts specified in clause 5.12.1.6.1.d (cabin buffer, counterweight buffer, upper and lower end breaker, loose rope, speed governor, cabin parachute and cabin loose rope contacts) are

deactivated. In this way, the elevator, which cannot operate due to the interruption of one or more of these contacts, can be electrically taken to the normal operating position in accordance with article 5.12.1.6.

- When performing manual control from LiftOne Re-Call Mode :

1) When the “normal operation/manual re-call” selection socket in the panel is in the re-call socket, normal operation is prevented by the LiftOne device due to broken safety circuit and no calls are accepted.

   The electrical devices specified in 5.12.1.6.1.d (cabin buffer, counterweight buffer, upper and lower end breaker, loose rope, speed governor, cabin parachute and cabin loose rope contacts) are disabled when LiftOne is in re-call operation mode.

2) The movement of automatic doors is blocked.

3) The cabin lamp is kept lit by the control system.

4) The emergency stop and safety circuits are active (they must be connected in accordance with the diagrams).

5) The user must ensure that the cabin speed does not exceed 0.30 m/s.

6) The cabin must be prevented from traveling beyond the normal limits of movement.

7) The cabin must be prevented from traveling beyond the normal limits of movement. If the maintenance control switch on top of the cabin or at the bottom of the shaft is switched to the maintenance control position at the same time, the manual control from the panel is canceled, that is, the elevator cannot be moved with the manual control buttons from the panel and the bridges of the bridged safety contacts are opened. The control of the elevator is also transferred to the maintenance buttons on the cabin or at the bottom of the shaft.

8) Priority of control

   ① Shaft Pit Box

② Cabin Top Control Box

③ LiftOne Re-Call Mode

9) A return to normal operation is only possible if both contacts of the maintenance switch are switched off. If the voltage at the 869R, 869K and 870 ends remains in ON state, the elevator cannot resume normal operation.

1.3 EN81-20 Standard Requirements

1.3.1 Motor Movement Timeout (Floor Travel Timeout)

At the end of the time set in the "D23 TRAVEL TIME OUT TIME" parameter, if the cabin does not reach a new floor, the control card switches to "TIMEOUT ERROR". This time is reset as the cabin is detected moving in the shaft. (Changing the status of MLA, MLB, 142 inputs resets the timer for the motor movement timeout.)

- The engine operating timeout period must be provided appropriately, not exceeding the lesser of the following periods.

- 45 seconds
- Longest cruising distance + 10 seconds
- If the maximum cruising distance time is less than 10 seconds, the timeout period must be at least 20 seconds.

- The "D23 FLOOR-TO-FLOOR TIME LIMIT" parameter in the menu should be set appropriately according to the above times. If the LiftOne fails to detect that the cabin has reached a new floor during timeout period, it will stop and deactivate the elevator.
- It will only be possible to switch to normal operation by manual intervention or by cutting off the supply of the panel.

- The timeout function is not activated during maintenance (revision) control (Cabin Top Box, Shaft Pit Box and Re-Call Mode from LiftOne).

1.3.2 Motor Overheating

- In the event of overheating of the motors with capacity above 0.5kW, the cabin movement should continue until the first stop where passengers can leave, then stop, allowing the occupants to leave the cabin.
- To meet this requirement, the following points must be fullfiled :

- In order to be able to check for overheating of the motor from the PTC thermistors in the main drive motor windings, the PTC leads must be connected to the P1, P2 terminal blocks on the LS-MAIN board.
- PTC thermistors of the automatic door motor, should be connected to the LS-INSP (Cabin Top Box Control Board). LS-INSP controls the PTC terminals and activates the fault output when it senses overheating. Related input pin names are DEA (for Gate A) and DEB (for Door B) terminal blocks located on the LS-INSP board.

1.3.3 Waiting Time on the Floor

- In elevators with manual doors, the cabin must wait at least 2 seconds after arriving at the floor before moving again.
- To meet this requirement, appropriately set the value of the parameter "F31 WAIT AT FLOOR TIME".

1.3.4 Internal Control Priority

- In elevators with manual doors, the cabin must wait at least 2 seconds after arriving at the floor before moving again.

- LiftOne prioritizes control according to risk. Therefore, once a higher priority mode requests control, lower tier importance modes are ignored. In the list below, first one is the highest priority.

- Shaft Pit Box Manuel Control Mode (869K)
- Cabin Top Box Manuel Control Mode (869R)
- Re-Call Mode from LiftOne Panel (Re-Call Switch in panel)
- Automatic Mode (Re-Call switchin panel placed in Automatic Mode in panel)

1.3.5 Directional Arrows

- Pick-up elevators should have arrows on the floors pointing in the direction of the next trip (the direction to be traveled).
- Position indication on floors is not recommended for group controls, but an audible warning (gong) is recommended before the cabin arrives on the floor.

1.3.6 Maintenance, Re-Call Switches, and Manuel Movement Buttons :

- The maintenance (inspection) switches on the top of the cabin and in the shaft pit box must have a total of four contacts, 3 normally closed (NC) and 1 normally open (NO). These contacts must be safety contacts in accordance with EN 60947-5-1. They must be written on the contact that they comply with EN 60947 and have a positive separation feature. In other words, if the contacts stick in the closed position, they should either not be turned or the adhesion should be separated when it is desired to be turned to the open position. For this reason, the mechanical connection between the luminaire and the contacts in these contacts should not be over elastic components such as rubber or springs.
- If the protection class of the protective enclosures of these contacts is at least IP4x, it must provide 250V insulation, and if it is less than IP4x, it must provide at least 500V insulation. These contacts should be in the class of AC-15 for alternating current safety circuits and DC-13 for direct current safety circuits.

- Its mechanical durability needs to be guaranteed to work at least 1 million times.
- To show its position next to the revision keys,
- NORMAL / INSPECTION (NORMAL / INSPECTION) should be written.
- Pointing to the position next to the maintenance (inspection) switch,
- NORMAL / GERİ AL (NORMAL / RE-CALL) should be written.
- ▲ and ▼ signs should be written next to the maintenance control and rollback control movement buttons. These buttons must be protected against accidental operation and must only be operational if pressed continuously. Manual control (re-call) sockets and buttons from the cabin must be placed in a place where the drive machine is clearly visible.

1.3.7 Emergency Stop Buttons

- The contacts of the emergency stop buttons at the bottom of the elevator shaft, on the cabin top, in the control panel and in the machine room must be safety contacts in accordance with EN 60947-5-5. (It should be written on the contact in accordance with EN 60947) When these buttons are released after pressing (disconnecting the circuit), they should not automatically return to the position that will give a circuit, but should be able to return to the position that will give a circuit by manual intervention (for example, a mushroom stop that rotates to the position that gives the circuit).
- If the protection class of the protective enclosures of these contacts is at least IP4x, it must provide 250V insulation, and if it is less than IP4x, it must provide at least 500V insulation. These contacts should be in the class of AC-15 for alternating current safety circuits and DC-13 for direct current safety circuits.
- STOP should be written visibly next or on the STOP buttons. (5.12.1.11.1)
- The emergency stop button should not be used in the cabin. (5.12.1.11.3)
- Emergency stop button locations for shaft pits with less depth than 1.6m.

- Single emergency stop button is sufficient if rules below are applicable.
- Minimum 0.4m higher than lowest floor level
- Maximum 2m higher than shaft pit ground level
- Maximum 0.75m away from floor door opening, horizontally.

- Emergency stop button locations for shaft pits with more depth than 1.6m
- Two emergency stop buttons are required, rules below are applicable.
- First Emergency button should be located:
- Minimum 1m away from lowest floor level vertically.
- Maxmimum 0.75m away from lowest floor door opening horizontally.
- Second Emergency button should be located:
- Available from refugee space
- Maximum 1.2m higher than shaft pit ground level

1.3.8 By-pass Sockets Disabling Landing and Cabin Doors

- For the maintenance of door locking contacts, by-pass sockets that disable the landing and cabin door contacts must be located in the control panel or emergency test panel/panel.
- By-pass sockets must be permanently installed and protected against mechanical movement or uncontrolled use in accordance with clause 5.11.2. If the control panel covers are protected by a locked key, this clause is met.
- By-pass sockets must be labeled with the word "BYPASS" written on or near their location.
- When the by-pass sockets are activated, the doors operated by automatic power, normal operation should be rendered ineffective, and the mechanical movement of the cabin should be prevented. Mechanical movement of the cab should only be allowed during maintenance and re-call operations.
- It should not be possible to disable the contacts of the cabin door/doors and landing doors at the same time with the by-pass sockets.
- The mechanical condition of the cabin door must be monitored by a separate signal to allow cabin movement.
- An audible signal in the cabin and a flashing light under the cabin should give an audible and visual warning during cabin movement. The sound level of the audible warning must be at least 55 dB (A) at a distance of 1 m under the cabin.

1.3.9 Labeling

- The contactor, relay, fuse and connection terminal blocks in the control cabin must be labelled in accordance with the wiring diagrams. If there are connectors to which more than one cable is connected, only the connectors must be marked, without the need to mark the cables connected to them individually. The value of the fuses on the board and, if necessary, the type should be written on or next to it.
- In control panels with redundant power supply, it is mandatory to write a warning letter such as (ATTENTION: There is an EVACUATION SYSTEM (ES) that is activated when the power is cut off in the elevator) at the machine room entrance and the LiftOne Cover.
- The landing and cabin door bypass sockets must be identified by writing the word "BYPASS" on or near them

1.3.10 Contactors

- For AC motor elevators, the main contactors (motor contactors and brake contactor, if any) must comply with the AC-60947 usage class described in EN 4-1-3. (5.10.3.1.1)
- The motor supply should be cut off by the methods indicated below. (5.9.2.5.4).
- The motor supply must be cut off with two contactors connected in series and independent of each other. (5.9.2.5.4.a)
- A contactor that cuts the circuit with all its poles. (5.9.2.5.4.b.1)
- A control device that cuts off the energy flow in the static elements and a monitoring device that controls whether the energy flow is interrupted at each stop of the elevator. (5.9.2.5.4.b.2).
- Electrical circuit in accordance with clause 5.11.2.3 (5.9.2.5.4.c).
- Speed-adjustable electric power drive system (5.9.2.5.4.d) with a safe torque off function (STO) function according to EN 61800-5-2:2007 Clause 4.2.2.2, which fulfills the requirements of SIL3 with at least one hardware fault

tolerance 1.

- The rated voltage of the contactor coils circulates in the safety circuits. In LiftOne, this voltage is 42VAC as standard. If desired, contactors with different coil voltages can also be used (42VAC, 42VDC, 110VAC), but this should be reported to LS AS at the time of ordering and it should be ensured that inputs 120, 125, 130, 135, 140 are produced in accordance with the contactor voltage to be used.

1.3.11 Monitoring the fault of contactors

- When the elevator stops, a circuit consisting of the series connection of the normally closed contacts of all motion breaker contactors is controlled by the LiftOne control unit to prevent the elevator from starting again if the motor does not open the supply circuit. (KRU input) Normally closed auxiliary contacts of contactors used for this purpose.

- It must be a safety contact in accordance with EN 60947.
- If there is a mechanical connection to the normally open main contacts and the normally open contacts cannot be opened, these normally closed contacts should not be closed.

1.3.12 Emergency Lighting

- At the points mentioned below, there should be emergency lamps that can provide at least 5 lux light intensity for 1 hour and can be automatically recharged. This lighting system should also be automatically activated in the event of an electric lamp supply failure. LS-INSP. and on the LS-SC board, the EMG output is the emergency lighting output.

- In each alarm initiation device in the cabin and on the cabin,
- At the center of the cabin, 1 m above the floor,
- On the roof of the cabin, 1 m above the floor.

1.3.13 Protection Against Electric Shock / Live Terminals

- Protection measures must comply with the rules set out in HD 60364-4-41.
- Shaft walls that contain electrical equipment that may cause a risk of electric shock and are not otherwise clearly displayed must be marked with the graphic symbol IEC 60417-5036. (5.10.1.2.1).
- Additional protection by means of a residual current protection device (RCD) with a working rated current capacity not exceeding 30 mA must be provided for :

- Socket outlets connected to cabin and shaft lighting circuit(s).
- If the safety circuit chain voltage has a voltage higher than 50 V AC.
- Circuits with a voltage higher than 50 V AC on the elevator cabin.

1.3.14 Level Correction

- The LiftOne is designed to be able to move the elevator with the door open to be able to make level correction. In addition, 2 shock and vibration resistant switches that define the door opening zone should be placed on the cabin.
- In accordance with the standards, the level correction process should start when the cabin shifts no more than 2 cm from the floor level.
- The level correction speed should not exceed 0.30 m/s.

1.3.15 Isolation

- For the best EMC compatibility, 24V signal cables should be kept as far away from other cables as possible, and these two types of cables should not be located side by side within the same conduit.
- In cases where two types of cables must pass through the same channel, a shielded cable should be used for high-voltage connections, and the screen of the cable should be connected to the grounding bus located in the panel.

- Only with the correct installation of the protector, earth connection and filters is compliance with EMC rules ensured.

1.3.16 Shaft Pit Control Station

- According to “EN81-20 5.2.1.5.1.c” shaft pit control station should be non-stationarily mounted 0.3m inside refugee space.

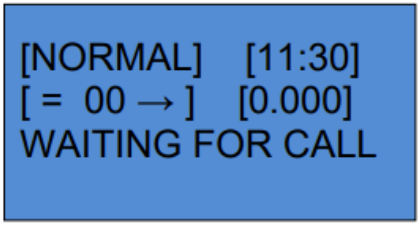
1.3.17 Shaft Pit Reset Switch After Revision

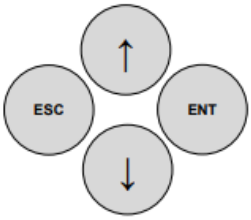
- According to “EN81-20 5.2.6.4.4.1 g)” “Shaft Pit Reset Switch After Revision” which should provide “KRST” signal to LiftOne. Should be placed outside the elevatör shaft, where only authorized personnel is able to use. (Operation of KRST button should be blocked by a key operated switch, or button should be in a locked cabinet).

2 Basic information

2.1 LCD Display & Keypad

2.1.1 LCD Display and Buttons





Button	Function
ESC	Exit / Cancel
↑ Up	Advancing in Menu / Modifying Parameter Value
↓ Down	Returning in Menu / Modifying Parameter Value
ENT	Enter / Select/ Saving Parameter Value

[NORMAL] : Status of LiftOne -> If it is revision mode, '[INSPECT.]' is shown on the screen.

[11:30] : Indication of the current time

[= 00 ->] : [= Current floor number -> Targeting floor number]

[0.000] : Motor speed (m/s)

WAITING FOR CALL : Current state -> if there is phase loss trip, 'PHASE FAILURE' is displayed on the screen.

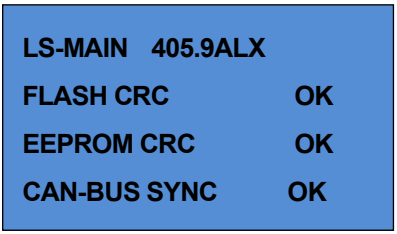
2.1.2 Software version screen

The software versions of all serial communication cards in the system are displayed on this screen. To access this screen, the "ESC" key must be held down on the main screen.

Display	Description
LS-Main 405.9ALX	Shows the software version of the LS Main
LS/INSP V3.00R	The revision box shows the software version of the card.
SC24-1 F2.07L	Shows the software version of the cabin cassette (COP) card.
LS L100 S/W : 6.10	Shows the software version of L100

2.1.3 After downloading LS-main software

LCD keypad is energized, it is the start screen below.



-	Function
LS-MAIN 405.9ALX	Displays the software version of the LS-Main card.
FLASH CRC*1	Software control is done.
EEPROM CRC*2	Parameter control is done.
CAN-BUS SYNC	The CanBus module is initialized by the software for serial communication.

1. If there is an error in the software installed on LS-main board or if an error occurred during installation, the "FLASH CRC ERROR" warning appears on the screen. Software must be installed on LS-main board via the bootloader, and if the software installation fails, the card must be sent to the company for repair.

2. If there is an error in the parameters set on the card or if an error has occurred, the message "EEPROM CRC ERROR" appears on the screen. When this message is seen, the "ENT" button is pressed, and the factory values of the parameters are tried to be reloaded. As a result of this process, the parameters of LS-Main board will be reset to the factory values, so the elevator parameters must be rechecked and adjusted. If this error cannot be corrected despite pressing the "ENT" button, LS-main must be sent to LSAS for repair. The details of the parameters for which EEPROM CRC checks are performed and affected because of the error given below.

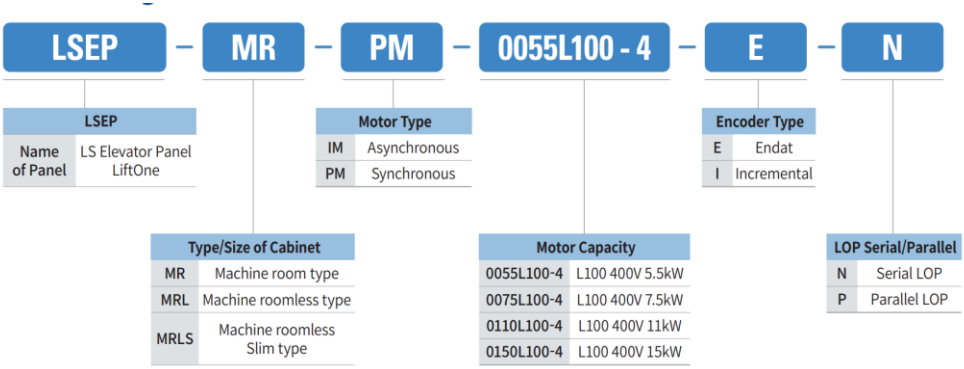
In addition, the EEPROM CRC check is carried out at the start of each movement and in call waiting mode. If an error has occurred, the message

"EEPROM CRC ERROR" appears on the screen.

Error	Explanation
MAIN CRC ERROR	The menu parameters have been reset and need to be reset.
FLOOR CRC ERROR	The shaft, indicators and gate parameters have been reset and need to be readjusted.
EEPROM CRC ERROR	All parameter values have been reset and need to be reset.

2.2 LiftOne nameplate

LiftOne Model naming



Options

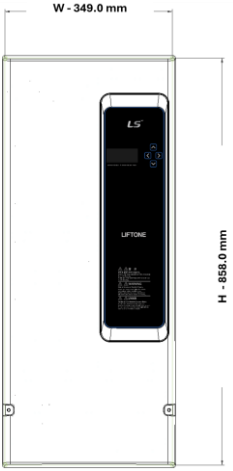
Item	Product Name	Remark
Insepction box	LSEP-LIFTONE-ACC-INSPECTIONBOX-STAND-0001	81-20 Inspection Box, standart type
	LSEP-LIFTONE-ACC-INSPECTIONBOX-REMOTE-0001	81-20 Inspection Box, remote type
Shaft pit box (Mandatory for one of them)	LSEP-LIFTONE-ACC-SHAFTPITBOX-PCBTYPE-0001	81-20 Shaftpit Box, PCB type
	LSEP-LIFTONE-ACC-SHAFTPITBOX-TERMTYPE-0001	81-20 Shaftpit Box, terminal type
Shaft pit accessories	SINGLEBUTTONBOX-LIGHT-0001	Single button box, light switch, metal case
	SINGLEBUTTONBOX-EMGSTOP-0001	Single button box, emergancy stop switch, metal case
	SINGLEBUTTONBOX-RESETKEY-0001	Single button box, reset switch, metal case
	SINGLEBUTTONBOX-BUZ-0001	Standalone box, buzzer, metal case
Magnetic sensor	LS-LADS	Advanced magnetic switch which includes Door zone sensor and floor sensor(Total 18 sensors inside)

2.3 Technical specifications

Item	Specifications
Max travel speed	4 m/s
Max stop number	32 stops
Max group number	Duplex (2 elevators)
Display	7 segment / Dot matix / TFT
Communication protocol	CANbus
Cabin Position- Leveling	LS-LADS Magnetic sensor
Motor range	5.5 kW – 14A / 7.5 kW – 18A / 11 kW – 26A / 15 kW – 35A
Software update	SD card
Certificate holding	SIL3 STO / EN81-20 / CE
Rescue operation	UPS (or battery)
Direct stop	Available
Early door opening	Available
Multiple car door support	Available
UCM (Unintended Car Movement Tracking) function	Available
Encoder	EnDat / SIN/COS / Incremental

2.4 Size / dimension / weight

2.4.1 MR (Machine Room) Type



Front view of MR

Side view of MR

Mounting part (fixing place)

Please follow the recommended instructions to mount LiftOne MR Type safely. LS-AS recommends three M6 bolts with washers and wall plug to secure fixing plate to wall.

According to wall type, select suitable wall plugs. Each wall plug should be able to support at least 15KG.

First place fixing plate to wall, make sure there is 5 cm empty area above. LiftOne's top will be aligned with fixing plate.

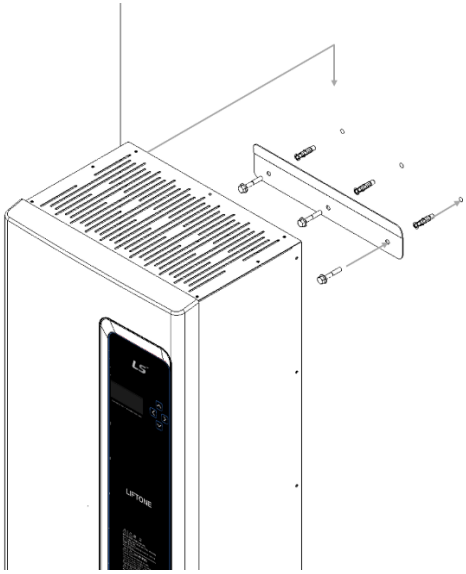
Align fixing plate horizontally, it should not be tilted more than 3 degrees to either side.

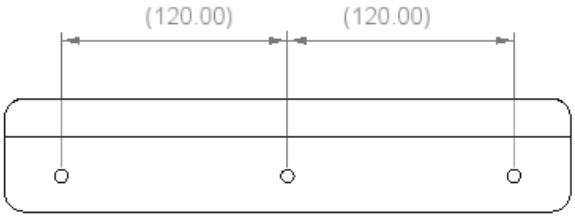
Mark the hole locations on wall.

Drill holes in order to place wall plugs.

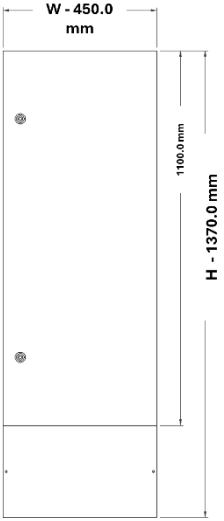
Use suitable screws to mount fixing plate to wall. Make sure fixing plates bent part is facing up and away from the wall.

Hang LiftOne MR Type to fixing plate. As shown in the picture below.

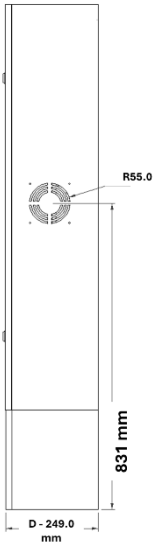



(120.00)
(120.00)

2.4.2 MRL (Machine Room Less) Type



Front view of MRL



Sdie view of MRL

Dimension information

Unit : (mm)

	W	H	D
MR Type (Machine Room)	349.00	850.00	253.75
MRL Type (Machine Room Less)	450.00	1,370.00	249.00

Weight information

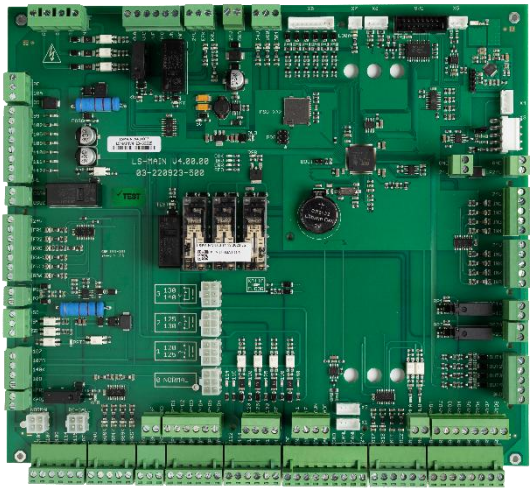
(kg)

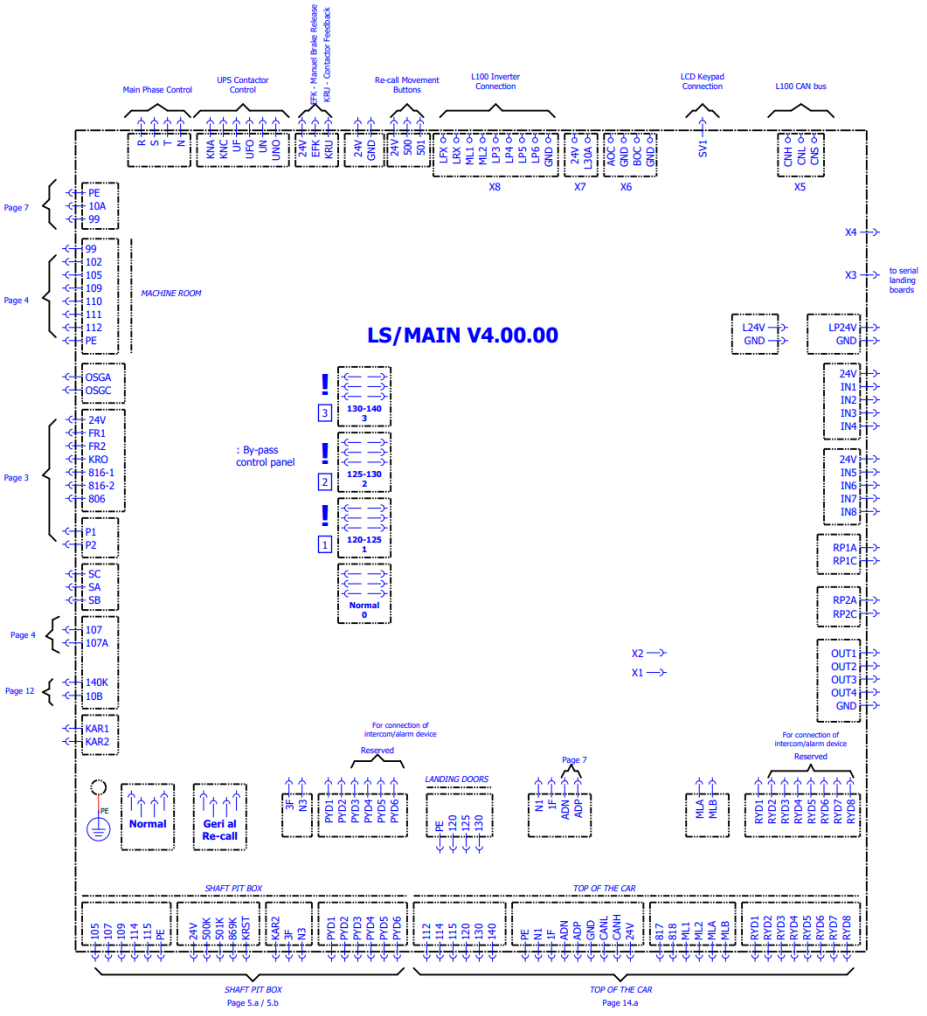
Weight											
MR-IM				MR-PM				MRL			
14A	18A	26A	35A	14A	18A	26A	35A	14A	18A	26A	35A
20.85	20.95	24.1	24.2	22.65	22.75	25.8	26	36.85	36.95	38.4	38.6

2.5 Terminal diagram

2.5.1 LS MAIN Control System

LS-MAIN is a microprocessor-based electronic elevator control system developed as software and hardware. It can be adjusted to be used in different types of elevator controls in accordance with the purpose of use of the building and the elevator. Thanks to its smart software and superior electronic hardware, it is possible to increase the level of security and functionality. The user can easily set many functions and timing parameters via the LCD display on the LS-MAIN board and using the button menu.




LS/MAIN V4.00.00
Main Phase Control
UPS Contactor Control
EFK - Manuel Brake Release
KRU - Contactor Feedback
Re-call Movement Buttons
L100 Inverter Connection
LCD Keypad Connection
L100 CAN bus
MACHINE ROOM
: By-pass control panel
Normal
Geri al Re-call
LANDING DOORS
SHAFT PIT BOX
TOP OF THE CAR
to serial landing boards
For connection of intercom/alarm device
Reserved
SHAFT PIT BOX
Page 5.a / 5.b
TOP OF THE CAR
Page 14.a

Terminal Explanation

NAME ON LS-MAIN	Description
MAIN PHASE CONTROL	
R	380V 3P – R Phase
S	380V 3P – S Phase
T	380V 3P – T Phase
N	Neutral
UPS CONTACTOR CONTROL (KY Relay)	
KNA	KY Relay Relay Output 1
KNC	COM Input for KNA
UF	COM Input for UFO
UFO	KY Relay Relay Output 2
UN	COM Input for UNO
UNO	KY Relay Relay Output 3
BRAKE AND FEEDBACK	
24V	24v DC Output
EFK	Manuel Brake Release Input
KRU	Brake Contactor Feedback Input
24V Power Output	
24V	
GND	
Re-call Movements	
24V	24v DC Output
500	Move Down Button Input
501	Move Up Button Input
X8 - L100 CONNECTIONS	
LFX	Motor Forward Run (24v DC)
LRX	Motor Reverse Run (24v DC)

ML1	ML1 Sensor Info to L100
ML2	ML2 Sensor Info to L100
LP3	High Speed Run Info to L100
LP4	FHM Info to L100
LP5	Battery Info to L100
LP6	ARD Info to L100
GND	L100 – Com for Inputs
X7 – L100 CONNECTIONS	
24V	L100 - Fault Output Com (24v DC Output)
L30A	L100 – Fault Output
X6 – L100 CONNECTIONS	
AOC	L100 – Encoder Return Pulse A Phase
GND	L100 – Encoder Return Pulse A Com
BOC	L100 – Encoder Return Pulse B Phase
GND	L100 – Encoder Return Pulse B Com
LCD Keypad Connection	
SV1	16 Pin Connector For LCD Keypad
X5 – L100 Communication	
CNH	L100 – CANH
CNL	L100 – CANL
CNS	L100 – CAN COMMON
X4 – STP16 Parallel LOP Board	
X4	CAN Communication cable
X3 – Serial LOP Board	
X3	CAN Communication cable

24V Power Input – Main Power Supply	
L24V	24v DC
GND	GND
24V Power Output – STP16/Serial LOP Boards	
LP24V	24v DC
GND	GND
Multi-Purpose Inputs 1	
24V	24v DC
IN1	Input 1 (24v DC)
IN2	Input 2 (24v DC)
IN3	Input 3 (24v DC)
IN4	Input 4 (24v DC)
Multi-Purpose Inputs 2	
24V	24v DC
IN5	Input 5 (24v DC)
IN6	Input 6 (24v DC)
IN7	Input 7 (24v DC)
IN8	Input 8 (24v DC)
Multi-Purpose Relay Output 1	
RP1A	Relay Contact A
RP1C	Relay Contact B
Multi-Purpose Relay Output 2	
RP2A	Relay Contact A
RP2C	Relay Contact B
Multi-Purpose Transistor Outputs	
OUT1	Output 1 (24v DC)
OUT2	Output 2 (24v DC)
OUT3	Output 3 (24v DC)
OUT4	Output 4 (24v DC)
GND	GND
TERMINALS FOR TOP OF THE CAR	
112	Speed Regulator Contact (42v AC) OUTPUT
114	Loose Rope Contact (42v AC) INPUT
115	Safety Circuit Node (42v AC) OUTPUT
120	Safety Circuit Node (42v AC) OUTPUT
130	Shaft Door Contacts (42v AC) OUTPUT
140	Car Door Contacts (42v AC) INPUT
PE	Earth Connection
N1	Car Fan Motor Supply (220v AC N)
1F	Car Fan Motor Supply (220v AC P)
ADN	Car Door Supply Output (220v AC N)
ADP	Car Door Supply Output (220v AC P)
GND	CAN Communication GND for LS-INSP
CANL	CAN Communication Low for LS-INSP
CANH	CAN Communication High for LS-INSP
24V	24v DC Output
817	Bottom Forced Slowdown Switch Input
818	Top Forced Slowdown Switch Input
ML1	ML1 Sensor Input
ML2	ML2 Sensor Input
MLA	MLA Sensor Input
MLB	MLB Sensor Input
RYD1	Direct cable for LS-INSP
RYD2	Direct cable for LS-INSP
RYD3	Direct cable for LS-INSP
RYD4	Direct cable for LS-

	INSP
RYD5	Direct cable for LS-INSP
RYD6	Direct cable for LS-INSP
RYD7	Direct cable for LS-INSP
RYD8	Direct cable for LS-INSP
TERMINALS FOR SHAFT PIT BOX	
105	Safety circuit beginnig node for shaft pit (42v AC) OUTPUT
107	Safety Circuit Node for Inspection Switch at shaft pit box (42v AC) OUTPUT
109	Safety circuit nodes “Car Buffer” ,“Counter-weight Buffer” and “Lower Limit” contact. (42v AC) Input
114	Safety Circuit Node for Inspection Switch at shaft pit box (42v AC) OUTPUT
115	Safety Circuit Node for Inspection Switch at shaft pit box (42v AC) INPUT
PE	Earth
24V	24v DC Output
500K	Shaft Pit Inspection Move Down Button Input
501K	Shaft Pit Inspection Move Up Button Input
869K	Shaft Pit Inspection

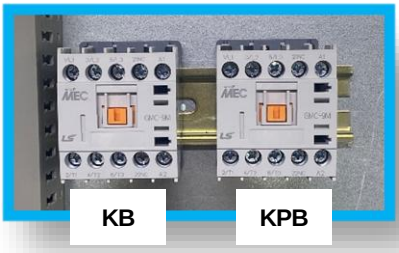
	Mode Enable Input
KRST	Shaft Pit Inspection Reset Input
KAR2	Shaft Pit Illumination Button (220v AC Phase) Input
3F	Shaft Pit Illumination Supply (220v AC Phase) OUTPUT
N3	Shaft Pit Illumination Supply (220v AC Neutral) OUTPUT
PYD1	0v DC Output
PYD2	Shaft Pit Alarm Button (0v DC) Input
PYD3	Reserved
PYD4	Reserved
PYD5	Reserved
PYD6	Reserved
EMERGENCY BUTTON	
PE	Earth
10A	42v AC Output
99	Emergency Button Contact in LiftOne (42v AC) Input
MACHINE ROOM	
99	42v AC Output
102	Emergency Button Contact in Machine Room (42v AC) Input
105	Shaft Entrance Door Contact (42v AC) Input
109	42v AC Output
110	Loose Rope Contact (42v AC) Input
111	Upper Limit Contact (42v AC) Input

112	Speed Regulator Contact (42v AC) Input
PE	Earth
Pre-Triggered Overspeed Governor Test	
OSGA	Pre-Triggered Overspeed Governor Coil Test Output (220v AC)
OSGC	220v AC Input
Brake Monitor / Fire Alarm / Earthquake Alarm	
24V	24v DC Output
FR1	Brake Monitor 1(24v DC) Input
FR2	Brake Monitor 2 (24v DC) Input
KRO	OSG Monitor (24v DC) Input
816-1	Fire Alarm 1 (24v DC) Input
816-2	Fire Alarm 2 (24v DC) Input
806	Earthquake Alarm (24v DC) Input
Motor Thermistor	
P1	Motor Thermistor Signal Input 1
P2	Motor Thermistor Signal Input 2
L100 STO	
SC	STO Signal Com
SA	STO A Signal Output
SB	STO B Signal Output
Safety Circuit	
107	Safety Circuit Re-Call Movement Buttons (42v AC) Output
107A	Safety Circuit Re-Call

	Movement Buttons (42v AC) Input
140K	End of Safety Circuit (42v AC) Input
10B	Safety Circuit (42v AC Neutral) Output
Shaft Illumination	
KAR1	220v AC Input
KAR2	Shaft Illumination Impulse Current Relay Coil Output (220v AC)
LiftOne Terminals	
3F	220v AC Input
N3	220v AC Neutral Input
PYD1	24v DC GND Input
PYD2	Alarm in Shaftpit Box Input
PYD3	Reserved For Intercom
PYD4	Reserved For Intercom
PYD5	Reserved For Intercom
PYD6	Reserved For Intercom
PE	Earth
120	Safety Circuit 42v AC Output
125	Shaft Door A Safety Circuit Contacts 42v AC Input
130	Shaft Door B Safety Circuit Contacts 42v AC Input
N1	220v AC Neutral Input
1F	220v AC Input
ADN	Photocell Supply (220v AC Neutral) Output
ADP	Photocell Supply (220v AC) Output

2.5.2 MR_IM (Machnie Room Induction Motor) Type

1) MR_IM Contactors



Name Tag	Description
KB	Brake Contactor 1
KPB	Brake Contactor 2

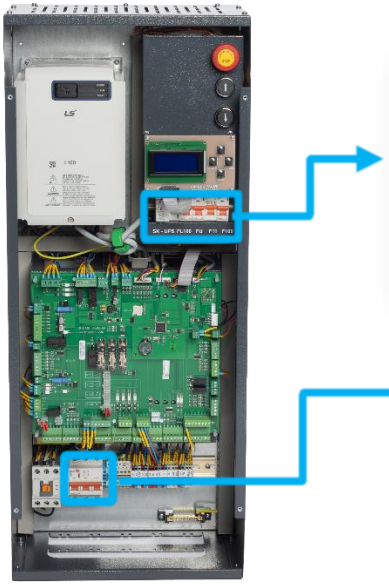
Name Tag	Description
KN	3 Phase Contactor For L100 Power Supply

2) MR_IM Terminals

Name Tag	Description
U	Motor U Connection
V	Motor V Connection
W	Motor W Connection
PE	Motor Earth Connection
P1+	Braking Resistor Connection
B	Braking Resistor Connection
1F	220v AC Phase Input
N1	220v AC Neutral Input
KAR	Shaft Illumination Relay Coil Trig ger 220v AC Phase Output
3F	Shaft Illumination 220v AC Phase Input
N3	Shaft Illumination 220v AC Phase Input
US	Main braker return 220v AC Phase Input
UL	Main braker 220v AC Phase Outp ut
UL	UPS Return P 220v AC Phase Inp ut
UN	UPS Return N 220v AC Neutral In put
IL	UPS Supply P 220v AC Phase Out put
IN	UPS Supply N 220v AC Neutral O utput
PE	UPS Earth Connection
841	Mechanical Brake Output 190v D C +
3000	Mechanical Brake Output 190v DC -
5F	Motor Cooling Fan 220v AC Phas e Output
5N	Motor Cooling Fan 220v AC Neutral Output
OSG+	Overspeed Governor Coil Output 190v DC +
OSG-	Overspeed Governor Coil Output 190v DC -

Name Tag	Description
R	3P 380v Phase R
S	3P 380v Phase S
T	3P 380v Phase T
N	3P 380v Neutral

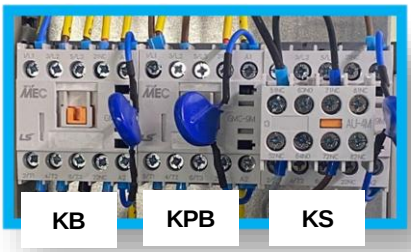
3) MR_IM Fuses



Name Tag	Description
SK-UPS	Residual Current Breaker for Transformer Input (Safety Circuit) SMPS (24v Supply) Photocell power OSG Coil* Brake Coil*
FL100	10A Fuse for Rescue Operation
FU	10A Fuse for SK-UPS
F11	1A Fuse for Transformer Output (Safety Circuit)
F100	4A Fuse for 24V SMPS Output
FCF	Main 3P Power Fuse

2.5.3 MR_PM (Machnie Room PM Motor) Type

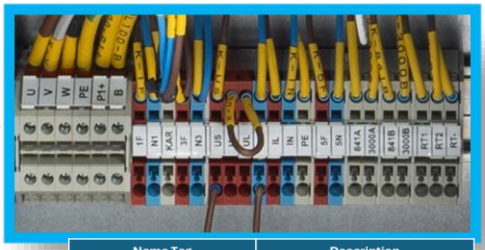
1) MR_PM Contactors



Name Tag	Description
KB	Brake Contactor 1
KPB	Brake Contactor 2
KS	U-V-W Shorting Contactor

Name Tag	Description
KN	3 Phase Contactor For L100 Power Supply

2) MR_PM Terminals



Name Tag	Description
U	Motor U Connection
V	Motor V Connection
W	Motor W Connection
PE	Motor Earth Connection
P1+	Braking Resistor Connection
B	Braking Resistor Connection
1F	220v AC Phase Input
N1	220v AC Neutral Input
KAR	Shaft Illumination Relay Coil Trig ger 220v AC Phase Output
3F	Shaft Illumination 220v AC Phase Input
N3	Shaft Illumination 220v AC Phase Input
US	Main braker return 220v AC Phase Input
UL	Main braker 220v AC Phase Outp ut
UL	UPS Return P 220v AC Phase Inp ut
UN	UPS Return N 220v AC Neutral In put
IL	UPS Supply P 220v AC Phase Out put
IN	UPS Supply N 220v AC Neutral O utput
PE	UPS Earth Connection
5F	Motor Cooling Fan 220v AC Phas e Output
5N	Motor Cooling Fan 220v AC Neutral Output
841A	Mechanical Brake1 Output 190v DC +
3000A	Mechanical Brake1 Output 190v DC -
841B	Mechanical Brake2 Output 190v DC +
3000B	Mechanical Brake2 Output 190v DC -
RT1	Overspeed Governor Test Coil O utput 190v DC +
RT2	Overspeed Governor Reset Coil Output 190v DC +
RT-	Overspeed Governor Coils Output 190v DC -

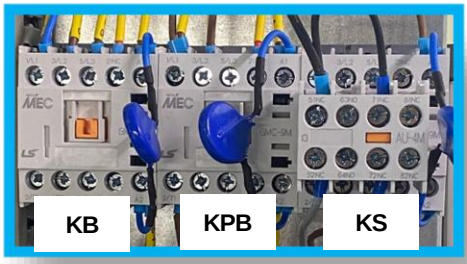
3) MR_PM Fuses

Name Tag	Description
SK-UPS	Residual Current Breaker for Transformer Input (Safety Circuit) SMPS (24v Supply) Photocell power Brake Coil*
FL100	10A Fuse for Rescue Operation
FU	10A Fuse for SK-UPS
F11	1A Fuse for Transformer Output (Safety Circuit)
F100	4A Fuse for 24V SMPS Output
FRT	OSG Coils*
FCF	Main 3P Power Fuse

** Required voltage is either 190v DC or 220v AC*

2.5.4 MRL (Machine Room Less) Type

1) MRL Contactors



Name Tag	Description
KB	Brake Contactor 1
KPB	Brake Contactor 2
KS	U-V-W Shorting Contactor

Name Tag	Description
KN	3 Phase Contactor For L100 Power Supply

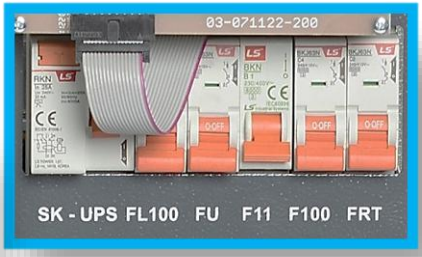
2) MRL Terminals

Name Tag	Description
U	Motor U Connection
V	Motor V Connection
W	Motor W Connection
PE	Motor Earth Connection
P1+	Braking Resistor Connection
B	Braking Resistor Connection
841A	Mechanical Brake1 Output 190v DC +
3000A	Mechanical Brake1 Output 190v DC -
841B	Mechanical Brake2 Output 190v DC +
3000B	Mechanical Brake2 Output 190v DC -
5F	Motor Cooling Fan 220v AC Phase Output
5N	Motor Cooling Fan 220v AC Neutral Output
N4	Shaft Illumination 220v AC Neutr al Output
4F	Shaft Illumination 220v AC Phase Output
UL	UPS Return P 220v AC Phase Input
UN	UPS Return N 220v AC Neutral Input
IL	UPS Supply P 220v AC Phase Output
IN	UPS Supply N 220v AC Neutral Output
PE	UPS Earth Connection
RT1	Overspeed Governor Test Coil Output 190v DC +
RT2	Overspeed Governor Reset Coil Output 190v DC +
RT-	Overspeed Governor Coils Output 190v DC

Name Tag	Description
R	3P 380v Phase R
S	3P 380v Phase S
T	3P 380v Phase T
N	3P 380v Neutral

3) MRL Fuses

Name Tag	Description
SK-UPS	Residual Current Breaker for Transformer Input (Safety Circuit) SMPS (24v Supply) Photocell power Brake Coil*
FL100	10A Fuse for Rescue Operation
FU	10A Fuse for SK-UPS
F11	1A Fuse for Transformer Output (Safety Circuit)
F100	4A Fuse for 24V SMPS Output
FRT	OSG Coils*
FCF	Main 3P Power Fuse
SCF	Main 3P Power Residual Current Breaker
SK-1F	220v AC Residual Current Breaker for Cabin 220v AC Shaft Pit 220v AC Shaft Illumination
FK	6A Fuse for Cabin 220v AC
KAR	Impulse Current Relay for Shaft Illumination
FSL	Shaft Pit 220v AC



3 Table of parameters

3.1 Quick menu

Code	Keypad display	Range	Unit	Default setting
Q0	-	-	-	CAN-BUS signal monitoring display between LS-MAIN and L100
Q0.3	GIVE SA/SB SIGNAL	NO YES	-	NO
Q0.4	LS L100 RESET	NO YES	-	NO
Q0.5	DIS01/00 Ai1 Value			display comes from L100 which user can choose for monitoring
Q0.6	DIS02/00 Ai1 Value			
Q0.7	DIS03/00 Ai1 Value			
Q1	-	-	-	Quick internal call issuance screen
Q2	-	-	-	Overspeed governor, brake contactor, manual brake release and bypass monitoring
Q3	-	-	-	Monitoring of shaft signals
Q4	-	-	-	Monitoring of safety circuit and phase inputs
Q5	-	-	-	Monitoring of cabin door entrances
Q6	-	-	-	Communication status of floor cards
Q7	-	-	-	Car speed, distance of location in cm and m/s.

Code	Keypad display	Range	Unit	Default setting
Q09	INSTALLATION MODE IN RECALL	PASSIVE ACTIVE	-	PASSIVE
Q10	LANDING CALLS DISABLE	NO YES	-	NO
Q11	DOOR OPEN DISABLE	NO YES	-	NO
Q12	COP CANBUS COMM. DISABLE	NO YES	-	NO
Q13	GIVE RANDOM CAR CALL	NO YES	-	NO
Q14	AutoTuneType	TEST PASSIVE DOWNWARD TEST UPWARD TEST	-	TEST PASSIVE
Q15	LIMIT TEST	TEST PASSIVE DOWNWARD TEST UPWARD TEST	-	TEST PASSIVE
Q16	BUFFER TEST	PASSIVE ACTIVE	-	PASSIVE
Q20	-	-	-	Monitoring of revision and reset signals
Q21	-	-	-	Backup inputs, monitoring of fire, earthquake and firefighter signals
Q22	-	-	-	Monitoring of minimum load, overload and full load signals
Q23	-	-	-	Monitoring of fan, intercom, alarm, watt switch and backup input signals
Q24	-	-	-	Monitoring of LS-MAIN board power part
Q31	RESET UCM ERROR	NO YES	-	NO

Code	Keypad display	Range	Unit	Default setting
Q31.1	PERMANENT ERROR RESET	NO YES	-	NO
Q32	LOPs AUTOMATIC ID ASSIGNMENT	PASSIVE ACTIVE	-	PASSIVE
Q33	PIT INSPECTION RESET	NO YES	-	NO
Q34	SHAFT COPY MODE	PASSIVE ACTIVE	-	PASSIVE
Q34.1	FLOOR OFFSET ADJUST FROM CAR	NO YES	-	NO
Q42	FIRE EVACUATION MODE RESET	NO YES	-	NO
Q43	EARTHQUAKE MODE RESET	NO YES	-	NO
Q44	T : 000000000000 C : 0000000000	-	-	T : Total number of travel floor (Permanent, not resettable) C : Number of travelled floor after the reset

3.2 C-> DRIVER SETTINGS (Parameter (PAR) group)

Code	Keypad display	Range	Unit	Default setting
PAR_01	Para. Init	0 (No) 1 (All Groups) 2 (DIS) 3 (PAR) 4 (DIO) 5 (AIO) 6 (FUN) 7 (CON) 8 (E/L) 9 (PRT) 10 (COM) 11 (USR)		0 (No)
PAR_07	Control Mode	2 (Speed(IM)) 6 (Speed(PM)) Note 1)		6(Speed(PM))
PAR_08	Application	0 (General Use) 1 (Elevator)		1 (Elevator)
PAR_09	Motor Select	0 (2.2) 1 (3.7) 2 (5.5) 3 (7.5) 4 (11.0) 5 (15.0) 6 (18.5) 7 (22.0) 8 (User Define) Note 4)		8 (User Define)
PAR_10	UserMotor Sel	5.5–22.0	kW	2.2
PAR_11	Max. Speed	30.00–120.00 / 10.0–3600.00 Note 5)	Hz/ rpm	680.0
PAR_14	Sync Speed	10.0–3600.0 Note7)	rpm	1800.0
PAR_15	Rated Volt	300–528	V	380
PAR_16	Pole Number	2–128		4
PAR_17	Efficiency	70.0–100.0	%	Varies by LiftOne

Code	Keypad display	Range	Unit	Default setting
PAR_18	Rated-Slip	0.10–25.00/ 1.0–250.0	Hz/ rpm	capacity
PAR_19	Rated-Curr	1.0–1000.0	A	
PAR_20	AC In Volt	320–480	V	380
PAR_21	PWM Freq	3 – 8.0	kHz	8.0
PAR_22	Cooling Mtd	0 (Self-cool) 1 (Forced-cool)		1 (Forced-cool)
PAR_23	Enc Type	0 (A/B Pulse) 1 (EnDat) 2 (Sin/Cos_All)		0 (A/B Pulse)
PAR_24	Enc Pulse	360–32768		2048
PAR_25	Enc Dir Set	0 (A Phase Lead) 1 (B Phase Lead)		1 (B Phase Lead)
PAR_27	Inv. Output	0 ((U-V-W)) 1 ((U-W-V))		0 ((U-V-W))
PAR_28	Motor Dir	0 (Keep) 1 (Change)		0 (Keep)
PAR_29	Torque Dir	0(FX/UP(+)) 1(FX/UP(-))		0 (FX/UP(+))
PAR_31	AutoTuneType	0 (Rotational) 1 (Standstill)		1(Standstill)
PAR_32	Kp for If	0.001–1.000		0.020
PAR_33	Ki for If	0.001–1.000		0.040
PAR_41	IM AutoTune	PAR_31=0 0 (None) 1 (ALL1) 2 (ALL2) 3 (Encoder Test) 4 (Rs Tuning) 5 (Lsigma) 6 (Flux Curr) 7 (Ls Tuning) 8 (Tr Tuning) PAR_31=1 0 (None) 1 (ALL 1) 4 (Rs Tuning) 5 (Lsigma) 8 (if/Tr/Ls Tune)		0 (None)
PAR_43	DetAve Num	1–30		5
PAR_44	MagDet Volt	5–200	V	90
PAR_45	MagDet Curr	10–150	%	80

Code	Keypad display	Range	Unit	Default setting
PAR_51	PM AutoTune	0 (None) 1 (All) 2 (Rs Tuning) 3 (Ld/Lq Tuning) 4 (Mag Pole Det)		0 (None)
PAR_52	Flux-Curr	0.0–70% of [PAR_19]	A	Varies by motor capacity
PAR_53	Tr	30–3000	ms	
PAR_54	Ls	0.00–500.00	mH	
PAR_55	Lsigma	0.00–300.00	mH	
PAR_56	Rs	0.000–15.000	ohm	
PAR_58	Ld	0.00–500.00	mH	
PAR_59	Lq	0.00–500.00	mH	
PAR_60	Init Theta	0–360	deg	0

Note 1) Select this option when a synchronous motor is used.

Note 2) Only visible when the setting value of PAR_08 Application is 'General Use'.

Note 3) A motor capacity that exceeds the LiftOne capacity cannot be selected.

Note 4) PAR_10 (UserMotorSel) is displayed when PAR_09 (Motor select) is set to “User Define.”

Note 5) Max Speed is 10.0–3600.0 rpm in “Speed(IM)” mode, 30.00–120.00 Hz in “Slip Comp” mode, and 10.0–680.0 rpm in “Speed(PM)” mode.

Note 7) PAR_14 (Sync Speed) is 10.0–3600.0 rpm in “Speed(IM)” mode, and 10.0–680.0 rpm in “Speed(PM)” mode.

Note 8) Displayed only when PAR-23 is set to "Endat, Sin/Cos_All, or Sin/Cos_1387."

Note 9) “Auto tuning” is not available during battery operations. Fixed to 'Standstill' when PAR_07 Control Mode is set to 'Speed(PM)'

Note 10) Only visible when the setting value of PAR_07 Control Mode is “Speed(IM)”.

Note 11) Only visible when the setting value of PAR_07 Control Mode is “Speed(PM)”.

3.3 C-> DRIVER SETTINGS (Control (CON) group)

Code	Keypad display	Range	Unit	Default setting
CON_02	ASR PI Ratio	1.0–500.0	%	30.0
CON_03	ASR P Gain1	0.1–999.9	%	IM: 50.0 PM: 100.0
CON_04	ASR I Gain1	0–50000	ms	IM: 300 PM: 50
CON_05	ASR LPF1	0–20000	ms	0
CON_06	ASR P Gain2	0.1–500.0	%	IM: 50.0 PM: 100.0
CON_07	ASR I Gain2	0–50000	ms	IM: 300 PM: 50
CON_08	ASR LPF2	0–20000	ms	0
CON_10	ASR Ramp	10–10000	ms	1000
CON_11	ASR TarSpd	0.0–3600.0	rpm	0.0
CON_12	ASRGainChgM	0 (Original)		0 (Original)

Code	Keypad display	Range	Unit	Default setting
		1 (Advanced)		
CON_33	Trq Lmt Src	0 (Kpd Kpd Kpd) 1 (Opt Opt Opt) 2 (CAN CAN CAN)		0 (Kpd Kpd Kpd)
CON_34	Pos Trq Lmt	0.0–250.0	%	200.0
CON_35	Neg Trq Lmt	0.0–250.0	%	200.0
CON_36	Reg Trq Lmt	0.0–250.0	%	200.0
CON_37	Trq Bias Src	0 (None) 1 (Analog) 2 (Keypad) 3 (Option) 4 (CAN)		0 (None)
CON_38	Trq Bias	-150.0–150.0	%	0.0
CON_39	Trq Bias FF	-150.0–150.0	%	0.0
CON_40	Trq Balance	0.0–100.0	%	50.0
CON_71	ARF Time	0–10000	ms	1000
CON_72	ARF ASR P	1–3000	%	100
CON_73	ARF ASR I	1–50000	ms	50
CON_74	ARF APR P	1–9999	%	150

Code	Keypad display	Range	Unit	Default setting
CON_75	ARF LPF	0 ~ 100	ms	0
CON_76	ARFASR RampT	2 ~ CON_71	ms	600
CON_77	AFRGain Scale	0.5 ~ 5.0		1.0
CON_78	ARF APR P2	1 ~ 1000	%	0
CON_86	DB OFF Level	620 ~ 760	V	760
CON_87	DB ON Level	765 ~ 780	V	780
CON_88	ACR P Gain	10 – 2000	%	100
CON_89	ACR I Gain	10 – 2000	%	100
CON_90	ACRd P Gain	10 – 2000	%	100
CON_91	ACRd I Gain	10 – 2000	%	100
CON_92	FluxCurr Lvl	0.0 – 100.0	%	80.0

Note 1) Visible when PAR_07 Control Mode is 'Speed(PM)'.

Note 2) Visible when PAR_07 Control Mode is 'Speed(IM)'.

3.4 C-> DRIVER SETTINGS (Elevator (E/L) group [Note 0])

Code	Keypad display	Range	Unit	Default setting
E/L_01	Max. CarSpd	0.01-7	m/s	1.000
E/L_02	Floor Number	1 – 32	FLOOR	32
E/L_03	Car Speed	0.01 – 7.000	m/s	1.000
E/L_04	Motor Speed	20.0 – 3600.0	rpm	1500.0
E/L_05	UP Direction	0 (FX-CCW) 1 (FX-CW)		0 (FX-CCW)
E/L_06	Rated Accel	0.10 – 1.00	m/sec^2	0.50
E/L_07	Rated Decel	0.10 – 1.00	m/sec^2	0.50
E/L_08	Acc Start T	0.50 – 2.50	sec	1.00
E/L_09	Acc End T	0.50 – 2.50	sec	1.00
E/L_10	Dec Start T	0.50 – 2.50	sec	1.00
E/L_11	Dec bEnd T	0.50 – 2.50	sec	1.00
E/L_12	CommDlyDist	100 – 1000	mm	400
E/L_13	DecStart Adj	-10 – 100	mm	0
E/L_14	PreExct Time	100 – 10000	ms	300
E/L_15	Brake Time	0 – 10000	ms	600
E/L_16	Hold Time	0 – 10000	ms	1500
E/L_17	Restart Time	1.00 – 100.00	sec	2.00
E/L_18	Plate Length	E/L_19 – 1000.0	mm	200.0
E/L_19	InductorEdge	0.0 – E/L_18	mm	20.0
E/L_20	FHM/BFR Speed	0.000 – 1.000	m/s	0.150
E/L_21	FHM DATA	0 – 321		0
E/L_22	Inspect Spd	0.000 – 0.620	m/s	0.500
E/L_23	Recall Spd	0.000 – 0.620	m/s	0.200
E/L_24	Relevel Spd	0.000 – 0.290	m/s	0.020
E/L_25	Level Spd	0.000 – 0.790	m/s	0.050

Code	Keypad display	Range	Unit	Default setting
E/L_26	Manual Spd5	0.000 – 1.000	m/s	0.250
E/L_27	Manual Spd6	0.000 – 1.000	m/s	0.050
E/L_28	Manual Spd7	0.000 – 1.000	m/s	0.150
E/L_29	MAN Accel.	0.01 – 5.00	m/sec^2	0.25
E/L_30	MAN Decel.	0.01 – 5.00	m/sec^2	0.25
E/L_31	ManAccStartT	0.01 – 2.00	sec	0.50
E/L_32	Man AccEnd T	0.01 – 2.00	sec	0.50
E/L_33	ManDecStartT	0.01 – 2.00	sec	0.50
E/L_34	Man DecEnd T	0.01 – 2.00	sec	0.50
E/L_35	ManZero Dec T	0.00 – 600.00	sec	2.00
E/L_36	NoSafety Man	0 (Normal) 1 (NoSafe_Spd1) 2 (NoSafe_Spd2) 3 (NoSafe_Spd3) 4 (NoSafe_Spd4) 5 (NoSafe_Spd5) 6 (NoSafe_Spd6) 7 (NoSafe_Spd7) 8 (NoSafe_Spd12)		8 (NoSafe_Spd12)
E/L_37	DistComp.Min	0.0 – 2×E/L_19	mm	0.0
E/L_38	DistComp.Max	0.0 – 100.0	mm	0.0
E/L_39	DistComp.Lev	-E/L_19 – E/L_19	mm	0
E/L_40	Creep Speed	0.001 ~ 1.000	m/s	0.050
E/L_41	Creep Dist.	0 – 500	mm	50
E/L_42	D/B End Dist	0 – E/L_19	mm	0
E/L_43	SpdZero Time	0.01 – 10.00	sec	2.00
E/L_44	ELIO In Neg	000000000000 –111111111111	-	001111111111
E/L_45	IND Filter	0 – 50	ms	5
E/L_46	SDS Filter	50 – 500	ms	250
E/L_47	ForcedDecSpd	0.000 ~ 7.000	m/s	0.000

Code	Keypad display	Range	Unit	Default setting
E/L_48	FrcdDecDist1	100 ~ 10000	mm	1000
E/L_49	ForcedCrpSpd	0.000 ~ 1.000	m/s	0.050
E/L_50	Frcd.DecWait	0 – 10000	ms	300
E/L_51	Use FrcdDcl2	0 (No) 1 (Yes)		0 (No)
E/L_52	Frcd.DecSpd2	0.000 ~ 7.000	m/s	0.000
E/L_53	FrcdDecDist2	100 ~ 10000	mm	1250
E/L_57	HighSpdStart	0 (Inductor ON) 1 (Always)	-	0 (Inductor ON)
E/L_58	AccStartType	0 (Linear) 1 (U-Curve)	-	0 (Linear)
E/L_59	StartupAccel	0.00 – 1.00	m/sec^2	0.00
E/L_60	StartupAccT	0.01 – 5.00	sec	0.50
E/L_61	StartupWait	0.00 – 5.00	sec	0.50
E/L_62	BFR/NFR Wait	0.00 – 5.00	sec	0.30
E/L_65	Display Sel.	0 (Car Spd (m/m)) 1 (Car Spd (M/S)) 2 (Car Spd (RPM)) 3 (Car Position) 4 (Trq Output) 5 (Lmt.S/W State) 6 (Tuning Dist)		1 (Car Spd (M/S))
E/L_66	Clear Posi.	0 (No) 1 (Yes)		0 (No)
E/L_67	Show FlrPosi	1 – E/L_02	FLOOR	1
E/L_68	FHM Start	0 (ID-OFF/IU-ON) 1 (DLS- ON/SD1-ON)	-	0 (ID-OFF/IU-ON)
E/L_70	UpDir Level	-E/L_19 – E/L_19	mm	0
E/L_71	DnDir Level	-E/L_19 – E/L_19	mm	0
E/L_74	2nd Auto Spd	0.001 ~ 7.000	m/s	0.500
E/L_75	2nd Rated Acc	0.10 – 1.00	m/s^2	0.50
E/L_76	2nd Rated Dec	0.10 – 1.00	m/s^2	0.50

Code	Keypad display	Range	Unit	Default setting
E/L_77	Free Run Spd	0.001 ~ 0.333	m/s	0.300
E/L_78	ELMC On Time	100 – 50000	ms	1000
E/L_79	ELMC OffTime	100 – 50000	ms	1000
E/L_80	SDSD1 Dist	0.0 ~ 6000.0	mm	1200.0
E/L_81	SDSU1 Dist	0.0 ~ 6000.0	mm	1200.0
E/L_82	SDSD2 Dist	0.0 ~ 6000.0	mm	2300.0
E/L_83	SDSU2 Dist	0.0 ~ 6000.0	mm	2300.0
E/L_84	Spd Ref Type	0 (DecelReq-D/B) 1 (DecelReq-T/B)		0 (DecelReq-D/B)
E/L_86	TrqDecTime	0 ~ E/L_16	ms	800
E/L_87	TrqDecAmt	0.0000 ~ 10.00	%	0.15

Note 0) When CAN communication is performed with PAR_07 Control Mode set to 'Speed(IM)' or 'Speed(PM)' and PAR_08 Application set to 'Elevator', the E/L group is displayed.
Note 1) Displayed when PAR_07 Control Mode is set to 'Speed(IM)'.
Note 2) Displayed when E/L_84 Spd Ref Type is set to 'DecelReq-D/B'.
Note 3) Displayed when E/L_84 Spd Ref Type is set to 'DecelReq-T/B'.
Note 4) Displayed when E/L_47 ForcedDecSpd is not '0.000'
Note 5) E/L_51 Use FrcdDcl2 is displayed when set to 'Yes'.
Note 6) Displayed when one of DIO_11 AX1 Define ~ DIO_14 AX4 Define is set to 'E/L MC Out'.
Note 7) Displayed when PAR_07 Control Mode is set to 'Speed (PM)' and applied when PAR_08 Application is set to 'Elevator'.
Note 8) Not necessarily used

3.5 A-> GENERAL SETTINGS

Code	Keypad display	Range	Unit	Default setting
A03	STANDARD COMPATIBILITY	EN81-20 EN81-1/2+A3 EN81-1/2+A3+869K	-	EN81-1/2+A3+869K
A06	MAX FLOOR COUNT	2-32	Floor number	5
A10	CONTROL TYPE	DOWN COLLECT-KSA SEL. COLLECT-KS CAR COLLECT-S24T FULL COLLECT-KSL	-	DOWN COLLECT-KSA
A15	OPERATION MODE	SINGLE LIFT MASTER A GROUP B	-	SINGLE LIFT
A20	BASEMENT FLOOR COUNT	X 1-5	-	X
A21	BOTTOM FLOOR DIFFERENCE	X 1-5	-	X
A22	TOP FLOOR DIFFERENCE	X 1-5	-	X
A30	DATE : 00/00/00 CLOCK : 00/00/00	-	-	System time settings
A35	MENU LANGUAGE	TURKCE ENGLISH	-	TURKCE
A40	SERIAL NUMBER	-	-	serial number and pin code of the LS-MAI

3.6 D -> SHAFT SETTINGS

Code	Keypad display	Range	Unit	Default setting
D05	SHAFY COPY TYPE	ENCODER ML1-ML2 ENCODER LS-LADS	-	ENCODER ML1-ML2
D20	FLOOR LEVEL SETTINGS	-	Floor number	-
D21	UPWARD FLOOR LEVEL DELAY	0-2.5 sec	sec	0.1 sec
D22	DOWNWARD FLOOR LEVEL DELAY	0-2.5 sec	sec	0.1 sec
D23	TRAVEL TIME OUT	5-120 sec	sec	27 sec
D24	ML1 & ML2 ERROR FILTER TIME	0-500 ms	ms	100 ms

3.7 E -> CAR SETTINGS

Code	Keypad display	Range	Unit	Default setting
E05	CAR LAMP TURN OFF TIME	X 5-15 sec	sec	9 sec
E10	CAR CALL LIMIT	X 1-9	Number of calls	X
E15	CAR FAN RUN TIME	0-300 sec	sec	50 sec

3.8 F -> DOOR SETTINGS

Code	Keypad display	Range	Unit	Default setting
F05	SHAFT DOOR TYPE	AUTOMATIC SWING AUTOMATIC+SWING	-	AUTOMATIC
F10	CAR DOOR TYPE	NO DOOR AUTOMATIC	-	AUTOMATIC
F12	REAR DOOR ENABLE	NO YES	-	NO
F13	FRONT/REAR DOOR SELECTION	-	-	which door will operate at which floor.
F15	AUTOMATIC DOOR FLOOR	0-47	Number of automatic doors	0

Code	Keypad display	Range	Unit	Default setting
F20	DOOR OPEN TIME	K16 sec 1-30 sec	sec	3 sec
F25	DOOR RE-OPEN TIME	K16 sec 1-30 sec	sec	1 sec
F30	DOOR CLOSE DELAY	0-30 sec	sec	1 sec
F31	WAIT AT FLOOR TIME	0-30 sec	sec	1 sec
F32	DOOR LOCKED TIME OUT	0-30 sec	sec	10 sec
F33	DOOR LOCK MONITOR TIME	0-30 sec	sec	2 sec
F34	DOOR LIMITS CONTACT TYPE	NO CONTACT NC CONTACT	-	NC CONTACT
F35	DOORCAM ENERGIZE DELAY	0-3 sec	sec	0 sec
F36	PHOTOCELL INPUT CONTACT TYPE	NO CONTACT NC CONTACT	-	NO CONTACT
F36.1	PHOTOCELL TIME OUT	X 10-60 sec	sec	X
F37	DOORCAM RELAY OPERATION TYPE	ENERGIZE TO LOCK RELEASE TO LOCK	-	ENERGIZE TO LOCK
F40	DOORCAM RELEASE DELAY	0-20 sec	sec	0 sec
F42	DOOR POSITION AT FLOOR	CLOSE OPEN	-	CLOSE
F45	DOOR SKATE RELEASE AT FLOOR	PASSIVE ACTIVE	-	PASSIVE

Code	Keypad display	Range	Unit	Default setting
F50	DOOR OPEN TIME OUT	X 10-60 sec	sec	60 sec
F55	DOOR REOPEN WITH LANDING CALL	NO YES	-	YES
F60	EARLY DOOR OPEN	NO YES	-	NO
F63	EARLY DOOR OPEN DISTANCE	0-30 cm	cm	10 cm

3.9 G -> FUNCTIONAL SETTINGS

Code	Keypad display	Range	Unit	Default setting
G01	BRAKE/POSG MONITORING FUNC.	NONE OVER SPEED REG. MOTOR BRAKE SPEED REG+BRAKE	-	NONE
G01.1	UCM FUNCTION	ACTIVE PASSIVE	-	ACTIVE
G02	TRAVEL LIMIT IN INSPECTION MODE	FLOOR LEVEL 817-818	-	FLOOR LEVEL
G02.1	RESET PIT INSPEC WITH LANDNG CALL	PASSIVE ACTIVE	-	PASSIVE
G05	CAR CALL CANCELLATION	PASSIVE ACTIVE	-	PASSIVE
G10	Travel START DELAY	0-3 sec	sec	0.1 sec
G15	PARK FLOOR	X 1-47	-	X
G16	PARKING DELAY	IMMEDIATE-5 min	sec	15 sec
G17	DOOR POSITION AT PARK	CLOSE OPEN	-	CLOSE
G20	FIRE EVACUATION FLOOR	0-32	Floor number	1
G20.1	2nd FIRE EVACUA. FLOOR	0-32	Floor number	X
G21	816 FIRE ALARM CONTACT TYPE	NO CONTACT NC CONTACT	-	NO CONTACT
G22	VATMAN MODE IN FIRE	PASSIVE ACTIVE	-	PASSIVE

Code	Keypad display	Range	Unit	Default setting
G23	FIRE EVACUATION FUNCTION	PASSIVE ACTIVE	-	PASSIVE
G23.1	FIRE EVACUATION MODE OUT TYPE	WITH SIGNAL SIGNAL&RESET>Q42	-	WITH SIGNAL
G24	DOOR POSITION AT FIRE EVAC. FLOOR	CLOSE OPEN	-	OPEN
G25	806 EARTHQUAKE CONTACT TYPE	NO CONTACT NC CONTACT	-	NO CONTACT
G25.1	EARTHQUAKE MODE OUT TYPE	WITH 806 SIGNAL 806 % RESET > Q43	-	WITH 806 SIGNAL
G26	DOOR POSITION IN EARTHQUAKE	OPEN CLOSE	-	OPEN
G30	MINIMUM LOAD FUNCTION	PASSIVE ACTIVE	-	PASSIVE
G40	LOP ACCESS CARD READING TIME	X sec 1-10 sec	sec	X sec
G40.1	LOP ACCESS CARD FLOOR	X 0-(A06-1)	Floor number	X
G41	COP ACCCES CARD READING TIME	X sec 1-10 sec	sec	X sec
G41.1	COP ACCESS CARD FLOOR	X 0-(A06-1)	Floor number	X
G45	120 ERROR	TEMPORARY ERROR PERMEMANT ERROR	-	TEMPORARY ERROR
G46	130 ERROR	TEMPORARY ERROR PERMEMANT ERROR	-	TEMPORARY ERROR
G47	140 ERROR	TEMPORARY ERROR PERMEMANT ERROR	-	TEMPORARY ERROR

Code	Keypad display	Range	Unit	Default setting
G50	FACTORY PARAMETER RESET	NO CONTROLLER SHAFT/DISPLAY	-	NO
G52	SOFTWARE UPDATE	NO YES	-	NO
G60	LOADING MODE	X sec 1-10 sec	sec	X sec
G61	PREFERENCE MODE	PASSIVE ACTIVE	-	PASSIVE
G62	ENERGY SAVING TIME	X 5-20 min	min	X

3.10 H -> RE-LEVELING SETTINGS

Code	Keypad display	Range	Unit	Default setting
H05	RE-LEVELING FUNCTION	PASSIVE ACTIVE	-	PASSIVE
H15	RE-LEVELING START DELAY	0-2.5 sec	sec	1 sec
H20	UPWARD RE-LEVEL STOP DELAY	0-2.5 sec	sec	0.1 sec
H21	DOWNWRD RE-LEVEL STOP DELAY	0-2.5 sec	sec	0.1 sec

3.11 I -> PHASE MONITOR RESCURE SETTINGS

Code	Keypad display	Range	Unit	Default setting
I01	PAHSE MONITOR MODE	PASSIVE SINGLE PAHSE NOT SEQUENCIAL SEQUENCIAL	-	NOT SEQUENCIAL
I05	EVACUATION FUNCTION	ON OFF	-	ON
I06	EVACUATION START DELAY	0-15 sec	sec	8 sec
I07	EVACUATION MOVE START DELAY	0-15 sec	sec	8 sec
I08	EVACUATION FUNCTION TIMEOUT	30-210 sec	sec	60 sec
I09	EVACUATION FINISH DELAY	0-10 sec	sec	3 sec
I10	DOOR POSITION AFTER EVACUATION	OPEN CLOSE	-	CLOSE

3.12 K -> DISPLAY SETTINGS

Code	Keypad display	Range	Unit	Default setting
K05	CAR DISPLAY TYPE	BINARY GRAY	-	BINARY
K10	LANDING DISPLAY TYPE	BINARY GRAY	-	GRAY
K12	GRAY/BINARY START VALUE	0-8	-	0
K15	FLOOR NAME SEQUENCE SETTING	-	-	Defines floor characters to be shown at landing and car indicators
K20	LOP DISPLAY LOCATION	LEFT RIGHT	-	LEFT
K25	ARROW TYPE	CURRENT DIRECTION NEXT DIRECTION CURRENT & NEXT	-	CURRENT DIRECTION
K30	CAR RESISTERED SOUND	ACTIVE PASSIVE	-	ACTIVE
K35	VOICE ANNOUNCE	ACTIVE PASSIVE	-	ACTIVE
K36	VOICE ANNOUNCE MUSIC	ACTIVE PASSIVE	-	ACTIVE

3.13 L -> PASSWORD SETTINGS

PASSWORD SETTING	
ENTER PASSWORD	000000 -> Insert 6 digits desired password
RE-ENTER PASSWRD	000000 -> enter same password

3.14 M -> STORED ERRORS

Code	Keypad display	Range	Unit	Default setting
M05	CONTROLLER STORED ERRORS DISPLAY ERRORS	-	-	It shows errors saved at control system. Saving total 48 errors is possible.
M10	CLEAR STORED CONTROLLER. ERRORS	NO YES	-	NO

4 Operation Functions

4.1 CAN Bus Serial Communication

The LiftOne control system uses CAN bus for serial communication. For the CAN bus communication to work properly and to prevent data loss, the line should be terminated with the appropriate impedance value by using the jumpers on the cards. The jumper descriptions on the cards are as follows.

 ATTENTION	Care should be taken to ensure that there is a 1000 signal next to the CANL-CANH lines in flexible connections and that high voltage and switched signals do not pass over the flexible cable where the CAN bus line is located. Installation should be made in accordance with the connection diagrams.

4.2 Operating in accordance with EN81-1-2/+A3 standard

LS-MAIN operates operating functions according to two different elevator standards. These standards are EN81-1-2/+A3 and EN81-20/50 standards. The operation of the elevator can be selected from the "A03 COMPATIBILITY" parameter of the desired standard LS-MAIN card. This ensures that the control system is operated according to the appropriate standard.

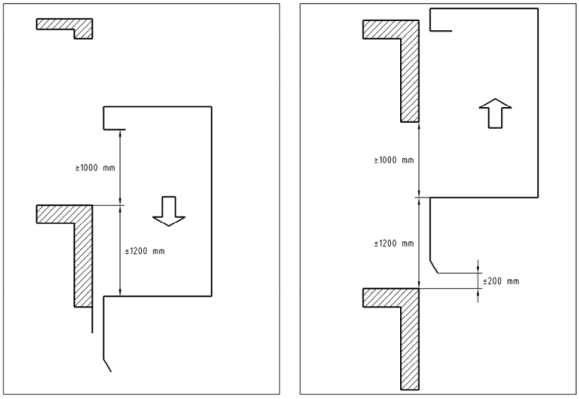
4.3 Unintended Cabin Movement (UCM)

The cabin, whose doors are open on the floor, must be prevented from slipping or moving from its floor because of a malfunction in the single component of the drive machine or the control drive system, except for the breakage of the suspension ropes or chains and the failure of the gear wheel of the drive pulley.

The cabin that involuntarily escapes from the floor while its doors are open should be stopped before it exceeds a maximum distance of 120 cm from the floor level. The distance values to be observed are clearly shown in the figure below.

Various systems are designed to stop Unintended cabin movement. There may be complete systems with Unintended detection and stopper triggering units, as shaft as systems installed by combining A3 (UCM) compatible components.

The LiftOne control system can be easily operated in harmony with complete solution systems. In the case of pre-triggered over-speed governors, it needs some settings from the menu to take over the tasks of sensing and triggering the stopper.



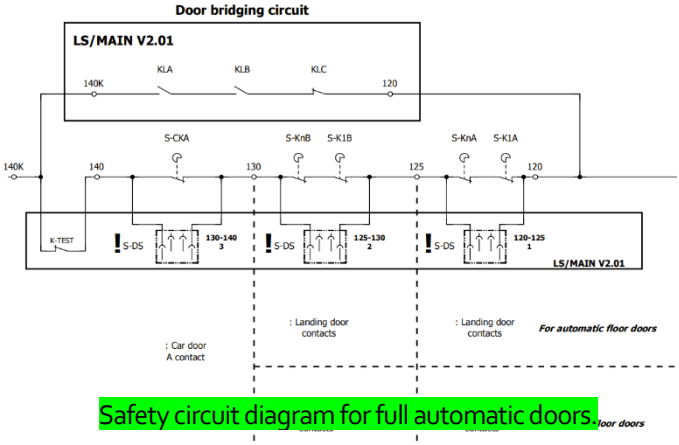
Example of stopping positions after UCM. (Left slipping down, right slipping up)

- The landing and cabin door bypass sockets must be identified by writing the word "BYPASS" on or near them
- In Rope Elevators: It is possible for the unintended movement of the cabin to take place in both directions. Therefore, when unintended movement occurs, the component that will stop the movement of the cabin must work in both directions.
- The system to be installed to prevent unintended cabin movement consists of sensor, control and stopper units. The component used as a stopper is the main point in the creation of the system.
- In gearless motor elevator applications, the stopper is an A3 (UCM) certified double brake on the motor. The control panel only monitors the contacts of these brakes and if one of the brakes is left on, it switches to the UCM error.
- In motorized applications with a geared drive machine, the bidirectional over-cab parachute brake, which is triggered by a pre-triggered speed governor, acts as a stopper. The control card checks whether the pre-trigger speed governor is working properly before and at the end of the movement. If the pre-trigger element of the speed governor cannot perform its job properly, the control panel gives a UCM error. If the cabin has left its floor Unintendedly, the control panel again switches to the UCM error and activates the pre-trigger element of the speed governor.
- After the control system switches to an unintended cabin movement error, it cannot get rid of this error situation with a revision switch or electrical on/off. However, the technician or an authorized person will have to come and select from the menu to recover the system from the error.
- Inspection of the Pre-Trigger Speed Governor in Rope Elevators: Before each movement, the trigger of the pre-trigger speed governor is removed and the normally closed contact on the trigger element is checked. If the output contact status is not in the state it should be, that is, if it has not switched to the open position, the control panel switches to UCM error and does not start the movement. The status of this contact is also checked during movement. If the output contact of the trigger element is switched to the closed position, the control panel gives an UCM error, and the movement is stopped.

- Inspection of Gearless Motor Brake Contacts: Before each movement and after the movement is given, the normally closed contacts of the brakes on the motor are checked. Before the movement, if the contact status is not in the state, it should be, that is, if it has not switched to the closed position, the control card switches to UCM error and does not start the movement. In the control made after the movement starts, it is checked whether the brake contacts are open or not. If the brakes are not opened, the control card switches to UCM error.

4.4 Safety circuit fault detection function

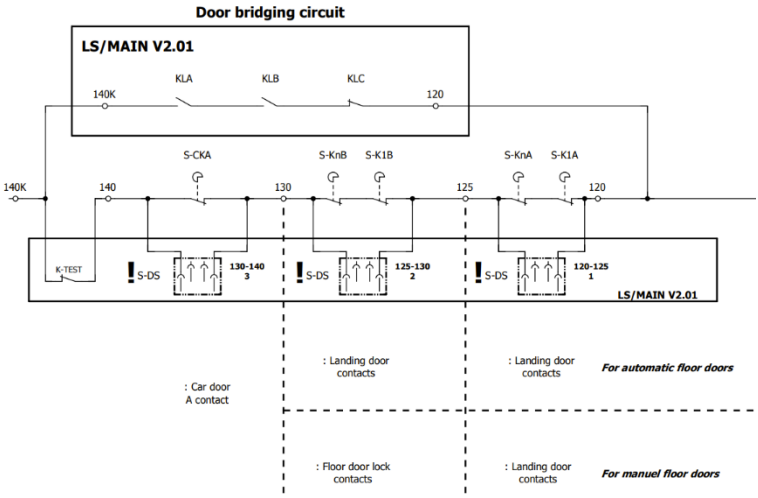
The elevator control system controls the safety security contacts related to the door during door opening and closing operations.



Safety circuit diagram for full automatic doors

4.4.1 Automatic door is opened on the floor

- After the cabin arrives on the floor, the door circuit is bridged with the door bridging circuit on the LS-MAIN card before the door opening process is performed and the door is started to open,
- After the door is opened (the doors are still bridged), the “130” input signal is checked,
- If the “130” input signal is not interrupted, a bridge is detected at the landing or cabin door and the "SAFETY CIRCUIT ERROR" error is recorded.



4.4.2 Slam (Manual) Doors

- After the cabin arrives on the floor, the door bridging circuit bridge on the LS-MAIN card is removed and the cabin door is started to open,
- Wait for the time set in the "F40 LIR RELEASE DELAY" parameter and if the 140 signal is not interrupted, it is detected that there is a bridge in the cabin lock circuit (140) and the error "EMNYT CIRCUIT ERROR" is recorded.

- Before starting the movement, the landing door is closed and the 130 input is checked before the Lirpomp is pulled, if the 130 signal is coming, it is detected that there is a bridge in the floor lock circuit and the error "EMNYT CIRCUIT ERROR" is recorded.

4.5 By-pass Mode and Control of Cabin Door Monitoring Signal

- By-pass mode has been made mandatory as a standard to ensure maintenance control of landing and cabin door contacts and maintenance safety. Only one door contact can be bridged in each position of the by-pass sockets. When the control system is in by-pass mode, it does not service normal calls and the safety circuit is broken. The mechanical movement of the cabin can only be initiated in maintenance (revision) or re-call operation modes. Audible and visual warning systems under the cabin, alert the maintenance crew/person when the cabin moves while in by-pass mode.
- The control system needs to check the actual position of the cabin door before starting the cabin movement when it is in by-pass operation mode. The movement of the cabin can only take place when the cabin door is closed. In the LS-MAIN control system, the actual position of the cabin door is monitored by the K19 (Door fully closed) signal. The K19 (Door fully closed) signal must be cut off before starting the cabin movement. As per the standard, the open circuit and short circuit status of the K19 (Door fully closed) signal should be checked.
- To check if the K19 (Door fully closed) signal is not connected at all, it is monitored that the K19 signal is present at the end of the door opening process.
- The type of door opening and closing limit signals K19 and K16 can be selected from the parameter "F34: DOOR LIMITS CONTACT TYPE". When the value of this parameter is selected as "normally closed", the limits will work as indicated below. When "Normally open" is selected, it works the other way around.

- When the door is open: K19 is present, K16 should be absent.
  When the door is closed: K19 must be absent, K16 must be present.

LOCATION	TASK
0	By-pass sockets are in a passive state
1	Lines 120-125 are by-passed.
2	Lines 125-130 are by-passed.
3	120-125 By-pass (bridged) between lines.

4.6 Shaft Pit Reset Switch After Revision

- The control system controls the resetting process with a locked key located on the outside of the door where the shaft is entered, which is prevented from being used by unauthorized persons, to control the exit of authorized personnel from the shaft after the revision process from the shaft. The control system does not return to normal operating mode and does not service calls without a reset (KRST).
- A return to normal operation is only possible if the maintenance key is switched off and all doors are closed (140 input needs to be energized through door safety circuit).
- If all doors are closed (140 signal is energized); "Waiting for KRST" is shown on the LS-LCD display,
- If the door(s) are not closed (140 signal is not energized); "Waiting for 140" is shown on the LS-LCD.
- When all the doors are closed (140 signal is energized); After the reset "KRST" switch is activated, the control system returns to normal operating mode.
- Shaft pit revision can be reset without “KRST” by LS-LCD. Select "Q33 EXIT DOWN-THE-HOLE REVISION" parameter and choose "YES" from the quick

menu.

4.7 Grid Phase Control

- It provides phase control with the 3-phase mains supply input on the LS-MAIN board. With the parameter "I01 PHASE MONITOR MODE", the following functions can be used.

- PASSIVE: Network phase control is not performed.
- SINGLE PHASE: The phase connected between T-N is controlled. The phase sequence is not considered. Mains voltage is checked. If there is no mains voltage, the recovery function is started. ("IS THERE An I05 RECOVERY?" If "VAR" is selected)
- NOT SEQUENTIAL: R-S-T Phase control is done out of order. Mains voltage is checked. If there is no mains voltage, the recovery function is started. ("IS THERE An I05 RECOVERY?" If "VAR" is selected)
- SEQUENTIAL: R-S-T Phase control is done sequentially. If the R-S-T Phase sequence is incorrect, the "PHASE SEQUENCE" error is passed. Mains voltage is checked. If there is no mains voltage, the recovery function is started. ("IS THERE An I05 RECOVERY?" If "VAR" is selected)

- If the "I05 EVACUATION FUNCTION" parameter "ON" is selected and the LS-MAIN card has detected a mains voltage error; Starts the recovery process. KN (Mains Relay) drops and KY (Backup power relay) is pulled and the recovery process is started. The KY relay remains pulled until the mains voltage comes, when the mains voltage comes, the KY relay drops and the KN relay pulls.

4.8 Motorman Switch

- When the motorman switch in the cab is turned to position "1" (+24V is supplied to the 812 input), all external calls are disabled and only internal calls are serviced. The cabin waits with the door open on the floor it goes to. With the use of the motorman switch, it is ensured that the elevator can only be used by authorized personnel in the cabin without the intervention of external calls. When the motorman switch is turned to the "0" position, normal operation is resumed.

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4.9 Earthquake

- When a signal is received/interrupted from the contact of the earthquake sensor in the building to the terminal 806 of the control panel, the elevator deletes all previously recorded internal and external calls, stops at the first stop where it is possible to stop, and opens the door, allowing passengers to leave the cabin as soon as possible. Since it is dangerous to use the elevator during an earthquake, it does not accept new calls and waits during the time the earthquake signal is received/interrupted. When the earthquake signal is interrupted/received, the elevator returns to normal operation again. The 806 Earthquake alarm contact can be set to "NO Contact" or "NC Contact" via the "G25 806 EARTHQUAKE CONTACT TYPE" parameter.
- With the parameter "G26 DOOR POSITION IN EARTHQUAKE", the door can be set to wait in the "Open" or "Closed" state when the earthquake (806) signal is active.

4.10 Fire Evacuation

- When a fire breaks out in the building, the fire alarm function is used to ensure the safety of the elevator passengers and to transport them to the predetermined evacuation stop as soon as possible. A switch that can be turned manually or a contact that can be taken from the existing fire alarm system in the building can be used as a fire alarm contact. This contact must be connected to terminal 816 of the LS-MAIN card. When the fire alarm signal is detected, the system switches to fire alarm operation. In this case, all recorded calls will be deleted, and no new calls will be recorded. The elevator automatically registers to the predetermined fire evacuation stop via the "G20: FIRE EVACUATION FLOOR" parameter in the menu. The photocell and door opening button that will prevent the door from closing are disabled. After the floor and cabin doors are closed, the elevator starts to move towards the fire evacuation floor. In moving elevators, if the elevator is moving in the direction of the evacuation stop, it goes directly to the evacuation stop without stopping at any other stop. The elevator, which moves in the opposite direction to the evacuation stop, stops at the first stop and moves towards the evacuation stop without opening its doors. When the elevator arrives at the evacuation stop, it opens its doors for passengers to get off If the "G24: DOOR POSITION AT FIRE EVAC. FLOOR" parameter is selected "OPEN", the fire alarm waits open on the evacuation floor until the ignition is turned off again. Otherwise, the door will be closed after 20 seconds. In this case, the door opening button is activated to prevent anyone from being trapped in the cabin. In addition, the door can be reopened by pressing the floor call button of the fire evacuation floor so that rescue teams can check if there is anyone trapped inside the cabin. The fire alarm contact can be set to "Normally Open" or "Normally Closed" via the parameter "G21: 816 FIRE ALARM CONTACT TYPE".

4.11 EN81-73 Fire Evacuation Mode

- This feature is a customized version of the fire evacuation function to meet the requirements of EN81-73 standards. For more detailed information, see EN81-73:2016 standard.
- When a fire alarm signal is detected, all previously registered floor and cabin calls are canceled, and no new records are received. Door opening and emergency alarm buttons are active. In any maintenance work (Revision, roll-back... etc.) The SKA output on the cabin card is triggered to give an audible warning. This signal is interrupted when the elevator is taken out of maintenance. The elevator must go to the fire evacuation floor by closing its door. Until the doors are closed, the SKA output on the cabin card is triggered and an audible warning signal is given. When the door is open for more than 15 seconds, the photocell is disabled, and the door is closed at low power. (A low-power shutdown command is given from the K1A and/or K1B relay.) Elevators with a manual landing door move to the fire evacuation floor after the landing door is closed. The elevator, which moves away from the fire evacuation floor, makes a normal stop at the first possible stop and heads to the fire evacuation floor without opening its doors. The elevator that goes towards the fire evacuation floor stops at the fire evacuation floor without stopping on any other floor. When the elevator arrives at the fire evacuation floor, it opens its doors for passengers to get off, and if " G24: DOOR POSITION AT FIRE EVAC. FLOOR” parameter “ON" is selected, the door waits open on the evacuation floor until the fire alarm ignition is turned off again. Otherwise, the door will be closed after 20 seconds. In this case, the door opening button is activated to prevent anyone from being trapped in the cabin. In addition, the door can be reopened by pressing the floor call button of the fire evacuation floor so that rescue teams can check if there is anyone trapped inside the cabin. When the EN81-73 fire evacuation mode is activated, the parameter "G21:816 FIRE ALARM CONTACT TYPE" is set to "Normally Closed" and is not allowed to be changed.

4.12 Motorman Mode in Fire Alarm

- When the "G22 VATMAN MODE IN FIRE" parameter is selected as "ACTIVE", the elevator control system can be used for fire intervention and rescue purposes by the authorities during the fire alarm alarm by switching to the motorman mode with the motorman switch in the cabin while it is in fire alarm mode. In this case, the operation of the elevator will be as described in the "Motorman Key" section.

4.13 Travel Time Out

- While the elevator is traveling, the travel time can be limited in order to detect situations such as the information coming from the location information switches is incorrect or the cabin cannot move for any reason, and to prevent the dangers that may occur in such cases. You can set the time to set for this function in the "D23 TRAVEL TIME OUT TIME" parameter. More detailed information can be found in the section "EN81-20 safety warnings".

4.14 Contactor Control

- Thanks to the signal that travels in series from the normally closed auxiliary contacts of all contactors powering the elevator motor and mechanical brake and connects to the KRU input, the control system can check whether the main contacts of these contactors are stuck before each movement. If the main contacts of one of the contactors are attached, the circuit will not be completed and there will be no signal to the KRU input, as the normally closed contact will also remain open. In this case, the control system deactivates the elevator and records an error. To remove error and return to normal operation, the authorized technician must intervene and replace the defective contactor. The technician must then return the control system to the maintenance

position and then return it to its normal operating position or disconnect the control system from the supply and switch it back on. The normally closed auxiliary contacts to be used to obtain the KRU signal must be of the type that remains in the open position when the main contacts remain attached. Otherwise, the contactor control function may not work correctly. In this case, LS Automation Solutions Otomasyon Sistemleri A.Ş. does not take responsibility

4.15 Contactor Control in Motion

- The control system checks the KRU signal before each movement and if there is a KRU signal, the elevator starts moving. After the elevator starts moving, it continues to control the KRU signal for 3 seconds. If the KRU signal is not interrupted, if there is a contactor that is not energized or left after being energized, the system records the error "KRU KSL" and stops the movement. It restarts the movement so that the contactors work as intended and remain pulled. If the problem persists, this process is repeated a total of 3 times, and if the error persists after the last attempt, the system will fail.

 ATTENTION	The normally closed auxiliary contacts to be used to obtain the KRU signal must be of the type that remains in the open position when the main contacts remain attached. Otherwise, the contactor control function may not work correctly. In this case, **LS Automation Solutions Otomasyon Sistemleri A.Ş.** does not take responsibility.

4.16 Delete an internal call

- Internal calls made from the elevator cabin can be canceled by pressing the same call button again. This function can be used by setting the parameter "G05: CAR CALL CANCELLATION" to "ACTIVATE". In this way, the elevator can be prevented from wasting time and energy by serving incorrectly or abandoned internal calls. The elevator control system continues to serve other registered calls and stops at the nearest floor if there are no more registered calls.

4.17 Card Entry on Floors

- Unauthorized calls from elevator external calls (floors) can be prevented with this function. In this function, only the process of receiving calls can be prevented and no authorization can be made separately for calls. When the LS-MAIN card's IN2 input receives a 100 (24V) signal from the card reading system dry contact output, the control system allows calls to be made from the floors for the time set in the "G40 LOP ACCESS CARD READING TIME" parameter. When the time expires, no new calls will be accepted.

4.18 Card Entry in the Cabin

- Calls by unauthorized persons from inside the elevator cabin can be prevented with this function. In this function, only the process of receiving calls can be prevented and no authorization can be made separately for calls. Make sure that the cab pushbutton board (LS-SC16 or when the LS-MAIN card receives a 100 (24V) signal from the card reading system dry contact output to the IN2 input, the control system allows calls to be made from inside the cabin for the time set in the "G41 COP ACCESS CARD READING TIME" parameter. When the time expires, no new calls will be accepted.

5 Testing and Commissioning

This section provides information on the steps to be taken during the testing and commissioning of the control system

 ATTENTION	During the testing and commissioning processes, The authorized person(s) who will perform the test should avoid situations that will put their own safety and passenger safety at risk and take the necessary precautions in transactions that will pose a security risk. Occupational safety measures should also be taken in accordance with the relevant regulation. Please make sure software version in LS-Main is higher then V4.05.1

5.1 Unintended Cabin Movement (UCM) Test

- The purpose of this test mode is to make it easier for installers to test whether the systems that prevent the unintentional movement of the car are working properly and the distance of the car to slip from the floor during any unintentional movement that may occur. The Control Unit performs this test by following the steps below.

- The following safety precautions should be taken and the test process steps should be applied.
- Make sure that there is no live in the cabin and well.
- Make sure the elevator doors are closed.

- Select the parameters "Q10 CANCEL EXTERNAL CALLS" and "Q11 CANCEL DOOR OPENING" "YES".
- If you want to create the most challenging conditions, select the "Q14 UCM

TEST" parameter "Downward Test" to test the fully loaded car downwards or select "Upward Test" to test the empty car upwards.

- The Control Unit sends the cabin one above the lowest stop or one below the top stop, depending on the test direction selected.
- When the car reaches the target floor, the Control Unit will automatically pull the RTEST relay and cut off the 140 (lock) signal.
- If the 140 signal is not interrupted even though the RTEST relay is pulling, the warning message "Remove 140" is shown on the display. Cut off the 140 signal on the LS-MAIN card.
- If the "140" signal is not interrupted within 5 seconds, the "UCM Test Mode" will be canceled.
- After the "140" signal is removed, the door is bridged between "120" and "140" with the bridging circuit, and the up or down movement of the car is started according to the test direction. When the car goes out of the door unlocking zone (MLA-MLB), the bridging between "120" and "140" will be removed, so the movement contactors drop and the movement of the cabin ends.
- The Control Unit switches to UCM error.
- It is checked whether the cabin can be stopped within the distances specified by the standard.
- On the Control Unit, the UCM error is cleared by selecting the parameter "Q31 CLEAR UCM ERROR" to "Yes".

5.2 Limit Test

- When the elevator is moving in the shaft, it must ensure that the movement is stopped if the car exceeds the shaft limits. For this purpose, there should be a lower breaker connected to the safety circuit 5 cm below the floor level of the lowest floor, and an upper breaker connected to the safety circuit 5 cm above the floor level of the top floor.
- To test whether the upper breaker and lower breaker contacts (stop contacts) are working, we need to move the cabin out of the floor level. In order to perform this test, the "Q15 LIMIT TEST" parameter is used.

5.2.1 Test of the bottom limit switch

- When "Downward test" is selected from the Q15 LIMIT TEST parameter, the cabin will reach 1st floor and stop. Then cabin moves to the bottom floor. On the way to the lowest floor, it does not stop on the floor and continues to move until the lower limit switch is interrupted with the speed of approaching. When it reaches the lower limit switch, the lower limit switch is interrupted, and the cabin stops.

5.2.2 Test of the top limit switch

- When "Upward direction test" is selected from the Q15 LIMIT TEST parameter, the cabin will reach 1 floor below the top floor. Then cabin moves to the top floor. On the way to the top floor, it does not stop on the floor and continues to move with the speed of approaching until the upper limit switch is interrupted. When it reaches the upper limit switch, the upper limit switch is interrupted, and the cabin stops.
- To return the elevator to normal operation, the cabin must be brought back within the operating limits. For this purpose, the cabin should be brought within the limits by switching to Re-Call mode from the control panel.

5.3 Cabin / Counterweight Buffer Contact Test

- To test that the cabin/counterweight buffer contacts are working correctly. This test is done from the Q16 CABIN/COUNTERWEIGHT BUFFER TEST parameter.

5.3.1 Cabin Bumper Contact Test

- This function can be activated in "Re-Call" mode. “Q16 CABIN/COUNTERWEIGHT BUFFER TEST” while in "Re-Call " mode. When the parameter is activated, the cabin is moved downwards in the "Re-Call" operation via manual movement direction buttons. When the car reaches the cabin buffer, the test is terminated by checking that the cabin buffer contact has switched to the open position.

5.3.2 Counterweight Buffer Contact Test

- This function can be activated in "Re-Call" mode. “Q16 CABIN/COUNTERWEIGHT BUFFER TEST” while in "RE-CALL" mode. When the parameter is activated, the cabin needs to be moved upwards in the "ReCall" operation via manuel movement direction buttons. When the counterweight reaches the counterweight buffer, the test is terminated by checking that the counterweight buffer contact has moved to the open position.
- To return the elevator to normal operation, the car must be brought back within the operating limits. For this purpose, the cabin should be brought within the limits by switching to “Re-Call” mode from the control panel.

5.4 Electric Mechanical Brake Opening

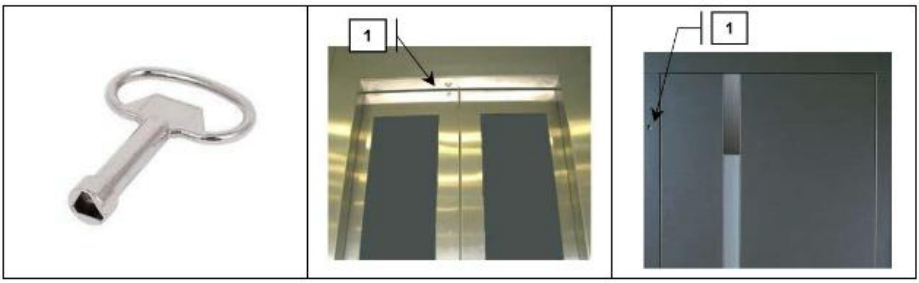
- Electrical mechanical brake opening system, especially in elevators without machine room, power failure, failure of the rescue system, failure of the driver... In such cases, it is used when the mechanical brake of the motor needs to be opened manually.
- When the mechanical brake is released, the cabin will move up or down according to the load balance. In cases where the load balance is equal, cabin may stay in place while there is equilibrium between counterweight and cabin.

 ATTENTION	If the backup power supply (UPS) in the system is not working, disconnect it and ensure that there is a 220 VAC voltage at the US and UN terminals in the control panel. You can use any 220 V AC source or other UPS.

- Make sure that there are no personnel or occupants in the elevator shaft.
- Make sure the elevator doors are closed and locked.
- If there are passengers in the cabin before starting the process, inform the passengers to avoid panic.
- With the opening of the mechanical brake, the safety of the passengers in the cabin during the time the brake is on will be on the authorized personnel who will carry out the operation.
- During this process, the authorized person must visually check that the cabin reaches the floor level.
- In case of overspeed of the cabin, stop the process immediately. (Release the SB1 and SB2 buttons and set the "SEB" cam switch to the "0" position.)

5.4.1 If the Cabin is at Floor Level

- **A**. If one or two of the "KATTA" LEDs (MLA-MLB) on the LS-MAIN board are lit, the cabin is within the door unlock zone.
- **B**. In this case, the mechanical brake does not need to be opened. Go to the floor where the cabin is located for the evacuation of passengers.
- **C**. Open the door in a controlled manner by informing the passengers with the triangular door key.



Triangle door key and slot on the door

5.4.2 If the Cabin Is Between Floors

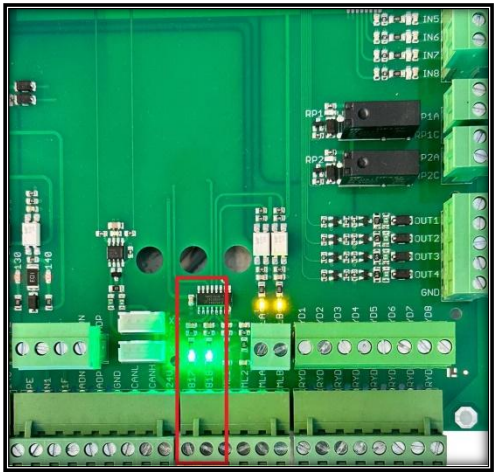
- **A**. If both of the "KATTA" LEDs (MLA-MLB) on the LS-MAIN board are not lit, the cabin is outside the door opening zone. With the mechanical brake opening process, it should be ensured that the cabin moves to the door opening area.
- **B**. The breaker pako switch with the code "SEB" in the control panel/door side frame is turned to the "1" position.
- **C**. The "EFK" input of the LS-MAIN card is active and the warning message "MANUAL BRAKE ON" appears on the LS-MAIN display.
- **D**. The "HB" lamp on the panel lights up and the siren "BZB" starts to sound. This indicates that the "SEB" pako switch is in position "1".

- **E**. When the "SEB" pako switch is in position "1", the "140K" signal of the control panel is interrupted and the control panel cannot initiate movement.
- **F**. By pressing the "SB1" and "SB2" buttons, the mechanical brake coils are energized and pulled.
- **G**. As soon as the "SB1" and "SB2" buttons are pressed, the mechanical brakes will be energized and the engine brake will be on. According to the elevator load balance, the elevator cabin will start free movement in the up or down direction.
- **H**. Technical personnel should continue this process in a controlled manner until one or both of the "KATTA" LEDs (MLA-MLB) on the LS-MAIN board light up (door opening zone) and by visually checking the cabin.
- **I**. After the cabin reaches the door opening area, open the door in a controlled manner by informing the passengers with the triangular door key.
- **J**. After the mechanical brake opening process is completed, the "SEB" pako switch is set to the "0" position and the buzzer sound is automatically interrupted. The LS-MAIN board returns to normal operating mode.

"Manuel Brake Testing Setup inside LiftOne"

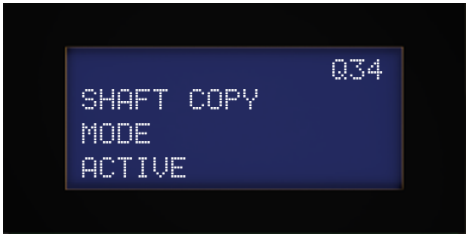
6 How to do FHM (Floor Height Measurement, Shaft Copy)

- **A**. First, our elevator should be at a location where the 817-818 LEDs on the device are lit. (Slow down bottom and slow down top sensors shouldn't be at interrupted state)



- **B**. By pressing the UP button, go to the "Q34: SHAFT COPY MODE" parameter.

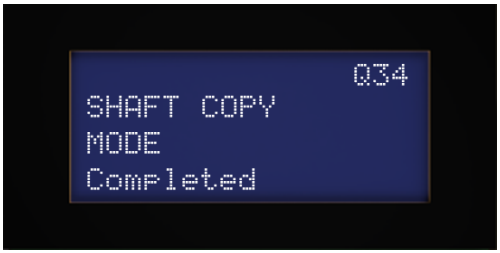
- **C**. Shaft learning mode is started by selecting "Q34: SHAFT COPY MODE" ACTIVE.



- **D**. The cabin will start moving downwards and will detect the lowest floor, when 818 is interrupted, ML1 and ML2 detects magnet, and once bottom ML sensor is out of magnet. While FHM is in process, the following message will be displayed on the LCD.

- **E**. When LiftOne detects the lowest level, FHM will be started upwards. Cabin will move until 817 (slow down top) switch is interrupted and ML1 and ML2 detects top floor. The cabin will move after 817 is interrupted, until top ML sensor is also out of magnet zone. If there is no error when cabin reaches final position, cabin will be sent to lowest floor.

• I. “Completed" message will appear on the screen. The shaft learning process is complete.



6.1 FHM (Floor Height Measurement) Errors

1) FLOOR COUNT ERROR

• Reason for occurrence of the error:

- The number of floors entered in the "A06 MAX FLOOR COUNT" parameter and the number of floors counted because of the FHM process are different.

• Fixing the error:

- Check the number of stops entered in the " A06 MAX FLOOR COUNT " parameter and make sure that it is correct.
- It must be ensured that there is the correct number of unlock zone magnets (MLA-MLB) in the shaft.
- The shaft magnet array should be checked and it should be ensured that the MLA-MLB signals come to the control panel

2) MAGNET SIZE ERROR

• Reason for occurrence of the error:

- The length of the unlock zone magnet is less than 27.5cm.

• Fixing the error:

- The length of the magnets should be checked, if there is a short magnet, it

should be replaced with a 30 cm magnet.

- The distance between the sensor and the magnet should be around 2cm. (According to the sensor used, 20mm is generally enough)
- If there is a magnet that coincides with the fasteners of the rail, raise magnet above fastener level. Because a flat magnet surface is required for sensor to work properly. (Cutting magnet and placing on top of and below the fastener to place a second magnet to obtain a flat surface is a viable option.)

3) DISTANCE ERROR BETWEEN FLOORS

• Reason for occurrence of the error :

- In order for the counter and leveling switches to work correctly, the distance between the 2 unlocking zones must be at least 30 cm. During FHM, the distance between the magnets is checked, if there is a floor shorter than 30 cm, this error will be shown.

• Fixing the error:

- Magnet placement should be checked, if there is a distance from floor to floor less than 60 cm, the counter and leveling will not work correctly.

4) ENCODER ERROR

• Reason for occurrence of the error :

- No data was received from the encoder during the FHM.

• Fixing the error:

- Encoder connections should be checked.
- It must be ensured that the encoder is working properly.

5) EEPROM ERROR

• Reason for occurrence of the error :

- The information received in the FHM could not be written to permanent memory.

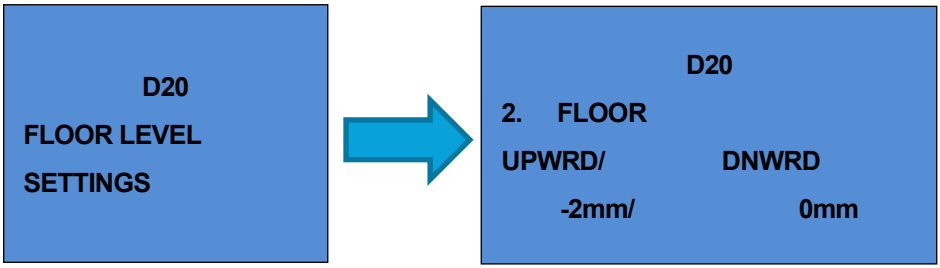
• Fixing the error:

- Have the FHM done again, if the same error is received again, the technical service should be contacted.

7 Precise Floor Level Adjustment

There are 2 ways to do floor level adjustment.

1) By using keypad,



2) By using COP(Car Operation Panel),

- **A**. Please go to"H05 RE-LEVELING FUNCTION" parameter and select "Active".
- **B**. Continue to press the door open button for 5 seconds.
- C. When entering the mode, the cabin lamp turns off once and then turns on again.
- **D**. When you press the bottom button (-1), the cabin moves down according to the level correction speed.
- **E**. Pressing the button (0) above the lowest floor raises the cabin at the level correction speed.
- **F**. The button is released when the cabin reaches floor level.
- **G**. The 5 second setting is saved by continuing to press the door open button. When the settings are saved, the interior lights will blink twice.
- **H**. The offset value in that direction changes in the direction in which the cabin reaches the floor.
- **I**. In up direction on 2nd floor, it was 2mm up compared to floor level. After making down by this procedure, this adjustment will be applied into the keypad automatically above

D20	
2. FLOOR	
UPWRD/	DNWRD
-2mm/	0mm

8 Trouble Shooting

When a problem occurs, please confirm the followings.

Error list & Troubleshooting guide

• **ERROR DISPLAY NAME**	• **1. SAFE MODE W=01**
• Reason	• Malfunction occurred in the crystal circuit of the LS-MAIN board.
• Result	• LiftOne resumes normal operation, this error is a warning.
• How to Solve	• No action required, during next repair center visit, LS-MAIN board's this fault will also be repaired.
• **ERROR DISPLAY NAME**	• **2. GROUP COMM. ERROR**
• Reason	• Communication error occurred, between duplex mode.
• Result	• LiftOne returns to simplex operation mode until fixed.
• How to Solve	• Check the group communication cable. If necessary, replace the cable.
	• If during installation, motor's «U-V-W» cables have been placed close to group communication cable, separate them.
	• Check if group communication line is terminated accordingly.
• **ERROR DISPLAY NAME**	• **3. DOOR COULD NOT BE OPENED**

• Reason	• LiftOne did not receive door open signal «K16A/B» after giving door open signal «K5A/B».
• Result	• LiftOne tries to open the door again if there are no active calls. Normal operation continues afterwards.
• How to Solve	• Door opening signal «K5A/B» should be checked with voltage meter.
	• Physically check the door system for any blockage.
	• AND-ADP should be measured with voltage meter, be careful there is supposed to be 220vAC in those terminals.
	• Check automatic door drivers and motor for any fault.
• **ERROR DISPLAY NAME**	• **4. COP COMM. ERROR**
• Reason	• LS-MAIN could not communicate with the COP board «LS-SC16» located at car.
• Result	• LiftOne will pause operation until communication is restored. If this error occurs during travel, car will stop at earliest floor possible and open its doors, and passengers are evacuated, then car will travel to lowest floor.
• How to Solve	• Check communication cable from LS-MAIN to «LS-INSP» and «LS-INSP» to «LS-SC16».
	• Make sure all boards are powered up.
• **ERROR DISPLAY NAME**	• **5. MLA/MLB ERROR**
• Reason	• When MLA/MLB signals are not interrupted when car is out of door unlocking zone. Their locations are saved during shaft copy.
• Result	• LiftOne will pause operation. If this error occurs during

	travel, LiftOne switches to slow speed and stops on earliest possible floor.
• How to Solve	• MLA/MLB magnet should be no longer than +-15cm from floor level (30cm recommended total length).
	• Check magnet position according to recommendations.
	• Check if MLA/MLB switches are working properly.
	• If during installation, motor's «U-V-W» cables have been placed close to group communication cable, separate them.
	• Check if group communication line is terminated accordingly.
• **ERROR DISPLAY NAME**	• **6. TIMEOUT ERROR**
• Reason	• Car did not reach a new floor while moving in «D23 – TRAVEL TIME OUT» number of seconds.
• Result	• LiftOne makes an emergency stop and does not operate in automatic mode. Has to be fixed.
• How to Solve	• Check «D23» parameter is enough for travel between floors.
	• Check the motor for rotation in the correct direction.
	• Check the mechanical brake, brakes should be opened during travel.
	• Check the rope of car, proper traction should be applied through pulley of motor.
	• Check ML1/2 switches. Their status can be observed from LEDs on «LS-INSP» or from «Q3» menu on LS-MAIN.
	• Check the ML1/2 magnet locations.
	• If everything above is correct, double check «D23»

	parameter and increase to allow more travel time.
• **ERROR DISPLAY NAME**	• **7. ERROR 817**
• Reason	• LiftOne does not operate if it detects bridge in 817 signal.
	• If «D05 Shaft Copy Type» parameter is chosen as «ENCODER LS-LADS», LiftOne calculates required distance from bottom floor level to «817» switch, and compares it to measured distance from shaft copy operation.
	• «ERROR 817» is given when «required distance» > «measured distance».
• Result	• LiftOne does not operate in automatic mode. Has to be fixed.
• How to Solve	• Check the connections of 817 switch.
	• Check deceleration time, lower the value and if error disappears check for car comfort with new value.
	• Physically check 817 switch, and magnet/flag, if there is a malfunction replace switch immediately.
• **ERROR DISPLAY NAME**	• **8. ERROR 818**
• Reason	• LiftOne does not operate if it detects bridge in 818 signal.
	• If «D05 Shaft Copy Type» parameter is chosen as «ENCODER LS-LADS», LiftOne calculates required distance from top floor level to «818» switch, and compares it to measured distance from shaft copy operation.
	• «ERROR 818» is given when «required distance» > «measured distance».

• Result	• LiftOne does not operate in automatic mode.
• How to Solve	• Check the connections of 818 switch.
	• Check deceleration time, lower the value and if error disappears check for car comfort with new value.
	• Physically check 818 switch, and magnet/flag, if there is a malfunction replace switch immediately.
• **ERROR DISPLAY NAME**	• **9. ERROR 819**
• Reason	• LiftOne does not operate if it detects bridge in 819 signal.
	• If «D05 Shaft Copy Type» parameter is chosen as «ENCODER LS-LADS», LiftOne calculates required distance from bottom floor level to «819» switch, and compares it to measured distance from shaft copy operation.
	• «ERROR 819» is given when «required distance» > «measured distance».
• Result	• LiftOne does not operate in automatic mode.
• How to Solve	• Check the connections of 818 switch.
	• Check deceleration time, lower the value and if error disappears check for car comfort with new value.
	• Physically check 819 switch, and magnet/flag, if there is a malfunction replace switch immediately.
• **ERROR DISPLAY NAME**	• **10. ERROR 820**
• Reason	• LiftOne does not operate if it detects bridge in 820 signal.
	• If «D05 Shaft Copy Type» parameter is chosen as «ENCODER LS-LADS», LiftOne calculates required

	distance from top floor level to «820» switch, and compares it to measured distance from shaft copy operation.
	• «ERROR 820» is given when «required distance» > «measured distance».
• Result	• LiftOne does not operate in automatic mode. Has to be fixed.
• How to Solve	• Check the connections of 820 switch.
	• Check deceleration time, lower the value and if error disappears check for car comfort with new value.
	• Physically check 820 switch, and magnet/flag, if there is a malfunction replace switch immediately.
• **ERROR DISPLAY NAME**	• **11. SAFETY CIRCUIT ERROR**
• Reason	• «A03» parameter is selected as «EN 81-20» and bridging is detected at safety contacts of shaft doors at the end of door opening sequence.
• Result	• LiftOne does not operate in automatic mode. Has to be fixed.
• How to Solve	• When shaft doors are open, make sure the safety circuit is disconnected. Remove bridges if present.
	• Make sure that the doors are freely able to open.
• **ERROR DISPLAY NAME**	• **12. K19 ERROR**
• Reason	• According to «A03 - EN81-20» standard, «K19 Door Fully Closed» input is monitored against bridges, open circuits or malfunctions during normal operation. «K19 ERROR» means that either a bridge or open circuit is detected in «K19 Door Fully Closed» feedback input.

• Result	• LiftOne does not operate in automatic mode.
• How to Solve	• Check «K19» connections.
	• Check «F34 DOOR LIMITS CONTACT TYPE» parameter is set properly. Confirm that «K19» signal is working according to «Normally Open» or «Normally Closed» selection.
	• Make sure door can move freely when door opening signal is given by LS-INSP.
	• If «K19» input is connected to limit outputs of the door driver card, make sure the «door learning» is done properly on the driver card, and open position of door is properly recognized by door driver card.
• **ERROR DISPLAY NAME**	• **13. KRU NOT INTERRUPTED ERROR**
• Reason	• Reason: After car starts moving, LS-MAIN energized the brake contactor(s), however «KRU Brake Contactor(s) Feedback» circuit was not interrupted as it should be. LiftOne tries to re-energize brake contactors 3 times, monitors «KRU» signal. If error still exists, LiftOne will show this error.
• Result	• If cabin is at floor, doors will be opened to evacuate passengers. Normal operation mode will continue after 10 seconds.
• How to Solve	• Check NC contacts of the brake contactors in LiftOne, where KRU signal is coming from. If any defective contact is found, replace immediately.
	• Contactors might be de-energized due to safety circuit, make sure safety circuit is properly working, check «140 LED» on LS-MAIN board.

• **ERROR DISPLAY NAME**	• **14. DOOR DID NOT CLOSE**
• Reason	• LiftOne couldn't confirm that doors are closed within «F32 DOOR LOCKED TIME» seconds. LiftOne tries to close the door 3 times by opening and re-closing. After third trial, if doors are not closed, LiftOne will show this error.
• Result	• All registered calls will be cancelled, normal operation mode will continue after 5 seconds. Until this error is fixed, LiftOne will not try 3 times and immediately show this error when door fails to close.
• How to Solve	• Check «K3 Close Door» signal on LS-INSP with voltmeter. Make sure «K3» output works.
	• Check the door for mechanical obstructions, door should be able to move freely.
	• Check ADN-ADP with voltmeter, read value should match with required voltage levels for door driver card.
	• Check door driver card for error/fault.
	• Check door motor connection, connectors might be disconnected between door driver and motor.
	• Check shaft doors contacts.
• **ERROR DISPLAY NAME**	• **15. DOOR LOCK ERROR**
• Reason	• «F05» is selected as «SWING» or «AUTOMATIC+SWING» LiftOne couldn't confirm that doors are locked within «F32 DOOR LOCKED TIME» seconds. LiftOne tries to lock the door 3 times by opening and re-closing. After third trial, if doors are not locked, LiftOne will show this error.

• Result	• All registered calls will be cancelled; normal operation mode will continue after 5 seconds. Until this error is fixed, LiftOne will not try 3 times and immediately show this error when door fails to be locked.
• How to Solve	• Check lock and door lock contact. Properly locked doors would turn on «140» LED on LS-MAIN.
	• Check the door lock contacts physically for conductivity.
	• Check «140» signal cable on LS-MAIN.
	• Make sure «F32» parameter is set higher than actual closing time of doors.
• **ERROR DISPLAY NAME**	• **16. MOTION DOOR ERROR**
• Reason	• Door closed signal lost during movement.
• Result	• LiftOne does emergency stop when this error occurs. LiftOne will record this error to memory and wait 5 seconds before resetting error to continue operation. If «130» signal is present and safety circuit is complete, LiftOne starts normal operation, if not waits for «130» signal and safety circuit completion.
• How to Solve	• Check all shaft door contacts, «130» signal in LS-MAIN.
	• Check «130» signals cabling on LS-MAIN terminal, and physically on door contacts.
	• Make sure there are no parts hanging from cabin and might hit locking mechanism of shaft doors during movement.
• **ERROR DISPLAY NAME**	• **17. MOTION DOOR LOCK ERROR**
• Reason	• Door locked signal lost during movement.

• Result	• LiftOne does emergency stop when this error occurs. LiftOne will record this error to memory and wait 5 seconds before resetting error to continue operation. If «140» signal is present and safety circuit is complete, LiftOne starts normal operation, if not waits for «140» signal and safety circuit completion.
• How to Solve	• Check all shaft door lock contacts, «140» signal in LS-MAIN.
	• Check «140» signals cabling on LS-MAIN terminal, and physically on door lock contacts.
• **ERROR DISPLAY NAME**	• **18. CABIN COMMUNICATION INTERRUPTED**
• Reason	• LS-MAIN lost communication with LS-INSP(car top box) board.
• Result	• LiftOne stops operation until communication is restored. If this error occurs during movement, LiftOne will stop at earliest possible floor.
• How to Solve	• Check communication cable. LS-MAIN terminal, cable carrying these signals, and LS-INSP terminal should be checked.
	• Terminal on LS-MAIN with «GND-CANL-CANH-24V» labels, and terminal on LS-INSP with same labels are carrying communication with flexible cable.
	• If all 3 points are properly conducting and stable, replace LS-INSP board and if error remains, replace LS-MAIN board.
• **ERROR DISPLAY NAME**	• **19. INVERTER ERROR**
• Reason	• L100 has an active error.

• Result	• LiftOne has to stop movement immediately, no further movement will be possible until this error is resolved. For more information, please read the bottom line of the screen. Current error on L100 can be observed from bottom line.
• How to Solve	• Please check related error from LiftOne manual or L100 manual.

Inverter error list

• **Keypad Display**	• **Description**	• **Cause**	• **How to Solve**
• Over Current	• Displayed when inverter output current exceeds the specified fault current.	• 1. Acc/Dec time is too short, compared to load.	• 1. Check the output wiring.
		• 2. The inverter load is greater than the rated capacity.	• 2. Replace the inverter with a model that has increased capacity.
		• 3. The mechanical brake of the motor is operating too fast.	• 3. Check the mechanical brake.
• Ground Fault	• Displayed when a ground fault occurs in the inverter's output, and current flow to	• 1. A ground fault has occurred in the inverter output wiring.	• 1. Increase Acc/Dec time.
		• 2. The motor	• 2. Replace the

	ground exceeds the specified level.	insulation is damaged.	motor.
• **Over Voltage**	• Displayed when the internal DC voltage exceeds the specified value (820 VDC).	• 1. Deceleration time is too short for the load inertia .	• 1. Increase the deceleration time.
		• 2. A generative load occurs at the inverter output.	• 2. Use the braking unit.
		• 3. The input voltage is too high.	• 3. Determine if the input voltage is above the specified value.
• **Low Voltage**	• Displayed when the internal DC voltage is less than the specified value (360 VDC).	• 1. The input voltage is too low.	• 1. Determine if the input voltage is below the specified value.
		• 2. A load greater than the power capacity is connected to the system (a welder, direct motor connection, etc.).	• 2. Increase the power capacity.
		• 3. The magnetic contactor connected to the power	• 3. Replace the magnetic contactor.

		source has a faulty connection.	
• **Low Voltage2**	• Displayed when the power supply to the inverter is cut off during an inverter operation and the power supply is resumed before the inverter is completely turned off. A reset is required to clear this error.	• 1. The input voltage has decreased during the operation.	• 1. Determine if the input voltage is below the specified value.
		• 2. An input phase-loss has occurred.	• 2. Check the input wiring.
		• 3. The power supply magnetic contactor is faulty.	• 3. Replace the magnetic contractor.
• **Over Load**	• Displayed when the inverter's output current exceeds the specified motor rated current and overload trip time.	• 1. The load is greater than the motor's rated capacity.	• 1. Ensure that the motor and inverter have appropriate capacity ratings.
		• 2. The set value for the overload trip level is too low.	• 2. Increase the set value for the overload trip level.
• **Inv OLT**	• Displayed when the inverter has detected an overload and	• 1. The load is greater than the rated motor capacity.	• 1. Replace the motor and inverter with models that have increased

	resultant overheating condition based on inverse time-limit thermal		capacity.
		• 2. The set value for the overload trip level is too low.	• 2. Increase the set value for the overload trip level.
• **InvOver Heat**	• Displayed when the temperature of the inverter heat sink exceeds the specified value.	• 1. There is a problem with the cooling system.	• 1. Determine if a foreign object is obstructing the air inlet, outlet, or vent.
		• 2. The inverter cooling fan has been operated for an extended period.	• 2. Replace the cooling fan.
		• 3. The ambient temperature is too high..	• 3. Keep the ambient temperature below 40℃.
• **InvThem OP**	• Displayed when an open circuit is detected in the thermistor inside the inverter.	• 1. The ambient temperature is too low.	• 1. Keep the ambient temperature over-10℃.
		• 2. An error has been detected on the internal temperature sensor.	• 2. Contact the retailer or the LSAS customer service center.
• **E-Thermal**	• Displayed when internal electronic	• 1. The motor has overheated.	• 1. Reduce the load or operation frequency.

	protection detects a high temperature condition at the motor.	• 2. The inverter load is greater than the rated capacity.	• 2. Replace the inverter with a model that has increased capacity.
		• 3. The set value for electronic thermal protection is too low.	• 3. Set an appropriate electronic thermal level.
		• 4. The inverter has been operated at low speed for an extended duration.	• 4. Replace the motor with a model that supplies extra power to the cooling fan.
• **External-B**	• Displayed when an external fault signal is generated.	• 1. The external fault B signal is connected.	• 1. Determine if the external fault B signal is connected.
• **Arm Short**	• Displayed when IGBT Arm or output fault occurs.	• 1. The IGBT is damaged.	• 1. Replaced the power board. Contact the retailer or the LSAS customer service center.
		• 2. A short circuit has occurred in the output wiring during the inverter operation.	• 2. Determine if the output short circuit has occurred. When using synchronous motors,

			determine if the motor 3-phase input short circuit has occurred.
• **Encoder Err**	• Displayed when an encoder signal error occurs. (H/W detection)	• 1. The encoder power is not connected.	• 1. Determine if the power that meets the encoder requirements is connected.
	• Displayed when an inconsistent encoder error time is detected when compared to the PRT_11 setting. (S/W detection)	• 2. The encoder wiring is incorrect.	• 2. Determine if the encoder is wired correctly.
• **Over Speed**	• Displayed when the motor speed exceeds the specified maximum speed.	• 1. An error has been detected on speed control.	• 1.1. Check the encoder wiring and the UVW output.
		• 2. The over speed error detection level and time is low.	• 1.2. Tune the encoder at PAR 28. Refer to Setting the encoder types (PAR_23), encoder scale (PAR_27), and encoder tuning options (PAR_28) for details.

		•	• 1.3. Adjust the speed control response. Refer to Speed controller (Automatic Speed Regulator: ASR) for details.
		•	• 2. Increase the over speed error detection level and time.
• **COM Error**	• Displayed when communication between the inverter and LS-Main is unavailable.	• 1. The keypad cable connection is bad.	• 1. Determine if the keypad cable is connected correctly.
		• 2. An error has been detected on control board communication.	• 2. Reset the inverter power.
		• 3. The OS for the control board has not been installed correctly.	• 3. Download the OS for the control board.
• **Output PO**	• Displayed when the inverter does not produce an output current.	• 1. A contact failure has been occurred to the magnetic contactor for the output side.	• 1. Check the magnetic contactor for the output side.

	• This feature is not available in Speed(PM) mode.	• 2. The output wiring is bad.	• 2. Determine if the output wiring is correct.
• **Input PO**	• Displayed when a single phase of a 3-phase power supply is interrupted while the inverter is under load.	• 1. A contact failure has been occurred to the magnetic contactor for the input side.	• 1. Check the magnetic contactor for the input side.
		• 2. The input wiring is bad.	• 2. Determine if the input wiring is correct.
		• 3. The time to replace the DC link capacitor has come.	• 3. Replace the DC link capacitor. Contact the retailer or the LSAS customer service center.
• **Spd Dev Err**	• Displayed when the difference between the motor speed and command speed is more than the specified value.	• 1. An error has been detected on the speed controller.	• 1.1. Increase the deceleration time.
		• 2. The response from the speed controller is high.	• 1.2. Tune the encoder at PAR 28. Refer to Auto-tuning part for details.
		• 3. The response from the speed controller is low.	• 2. Decrease the speed control response. Refer to Speed controller

			(Automatic Speed Regulator: ASR) for details.
		• 4. An error has been detected on opening brake and MC.	• 3. Increase the speed control response. Refer to Speed controller (Automatic Speed Regulator: ASR) for details.
		• 5. The speed deviation error level and time are low.	• 4.1. Check the brake operation.
		•	• 4.2. Check the MC operation.
		•	• 5. Increase the speed deviation error level and time.
• **Mag Det Err**	• Displayed when the power source to the motor is is cut off for longer than 10 seconds during a magnetic pole detection of a PM motor, or when the magnetic pole detection is	• 1. Power is not output to the motor, or the run command has been turned Off during a magnetic pole detection.	• 1. Check the cable connection between the inverter and the motor. If an MC has been installed between the inverter and the motor, ensure that the main contacts of the MC are closed (On).

	incomplete.		
• **FAN Error**	• Displayed when a cooling fan error is detected.	• 1. Substance is stuck in the fan.	• 1. Please check if fan is free.
		• 2. If fan is broken.	• 2. Please contact LSAS.
• **BatRun Fault**	• Displayed when battery operation signals are lost during a battery power operation.	• 1. Battery is broken.	• 1. Please check if battery is ok.
		• 2. Battery cable is not connected properly.	• 2. Please check if battery cable connections is correct.
• **Flr/FHM Data**	• Displayed when a floor height data error is detected, or a floor height measurement failure occurs. Available only when the exclusive elevator mode is used.	• 1. Floor number setting is wrong.	• 1. Please check floor number setting is correct.
		• 2. If the floor height is over 60cm.	• 2. Height of floor is less 60cm, it is not possible to do FHM.
• **SDS Error**	• Displayed when a slow down switch is lost at start operation.	• 1. Slow down switch location is wrong after FHM.	• 1.1. Please check if slow down switch is broken.
			• 1.2. Please check if slow down

			switch location is changed.
• **SAFETY A/B**	• Displayed when there is a safety terminal wiring fault on the control board. The response can be set at either Latch or Level.	• 1. If the Safety Relay is open, the inverter output stops and “SAFETY A (or B)” is ON. If the inverter was in operating when the Safety Relay opened, a free-run stop occurs.	• 1. Please check safety circuit.
• **ADC Error**	• Displayed when current calibration is incorrect when power is initially supplied to the inverter.	• 1. Analogue to digital converting is not correctly.	• 1. Please contact LSAS
• **EnDat ERROR**	• Displayed when Endat signals for the Clock or Data lines are not connected or a communicatio n error is detected.	• 1. Endat signal is lost.	• 1. Please check Endat encoder signals.
• **FHM Run**	• Displayed when FHM	• 1. Limit switch is too close to	• 1. Please check limit switch

Fail	operation is fail.	top or bottom floor.	location.
		• 2. FHM speed is too fast.	• 2. Please check if FHM speed is too fast. (recommendation : below 0.5m/s)
• **IM : Rs/sL/Ls/Tr Error**	• Displayed when auto tuning is failed.	• 1. If output of inverter is not connected.	• 1. Please check inverter output connection.
• **PM : Ld/Lq Error**			

• **ERROR DISPLAY NAME**	• **20. INV. COMMUNICATION INTERRUPTED**
• Reason	• LS-MAIN lost communication with L100.
• Result	• LiftOne stops operation until communication is restored. If this error occurs during movement, LiftOne will stop at earliest possible floor.
• How to Solve	• Check L1-L2-L3 terminals for 3Phase mains power.
	• Check UPS if present, otherwise related bridging cable should be checked. (UL-IL)
	• Re-plug internal CANBus cables between LS-MAIN<->LS-INSP and LS-MAIN<->L100
	• Re-plug encoder cable between L100 and LS-MAIN. Some cases of encoder signal might cause comm. İnterruption. Check if comm. is working without encoder cable connected.

• **ERROR DISPLAY NAME**	• **21. INV. RW ERROR**
• Reason	• LS-MAIN failed to read or write parameters from the L100.
• Result	• LiftOne stops operation.
• How to Solve	• If this error occurred while manually adjusting parameters, please try to set same parameter again with a different value.
	• Check L1-L2-L3 terminals for 3Phase mains power.
	• Check UPS if present, otherwise related bridging cable should be checked. (UL-IL)
	• Make sure that LS-MAIN is communicating with L100.
• **ERROR DISPLAY NAME**	• **22. SHAFT LEARNING ERROR**
• Reason	• Shaft copy operation did not succesfully complete.
• Result	• LiftOne stops operation until communication is restored. If this error occurs during movement, LiftOne will stop at earliest possible floor.
• How to Solve	• Check communication cable. LS-MAIN terminal, cable carrying these signals, and LS-INSP terminal should be checked.
	• Terminal on LS-MAIN with «GND-CANL-CANH-24V» labels, and terminal on LS-INSP with same labels are carrying communication with flexible cable.
	• If all 3 points are properly conducting and stable, replace LS-INSP board and if error remains, replace LS-MAIN board.

• **ERROR DISPLAY NAME**	• **23. CONTACTOR ERROR**
• Reason	• KRU circuit was not interrupted, LS-MAIN checks for brake contactors release at beginning of movement.
• Result	• LiftOne opens doors to evacuate passengers, then inhibits operation.
• How to Solve	• Check the NC contacts of the contactors in LiftOne, where KRU terminal is connected to. Replace faulty contactors.
	• Contactors might be working properly, however safety circuit might be interrupted and cause contactor to release abruptly. Check safety contacts.
• **ERROR DISPLAY NAME**	• **24. UCM ERROR**
• Reason	• Unintended car movement was detected.
• Result	• LiftOne inhibits further operation. Check parachute brakes on the cabin, UCM signal may have activated them.
• How to Solve	• 1.Reason of UCM Error should be detected.
	• 2.According to «G1» parameter, check motor brake feedback signals and/or speed governor signal.
	• 3.Switch to re-call mode.
	• 4.Select «YES» at «Q31» parameter.
• **ERROR DISPLAY NAME**	• **25. EEPROM CRC ERROR**
• Reason	• EEPROM memory is faulty in LS-MAIN. Parameter detoriation is detected.
• Result	• LiftOne inhibits further operation.

• How to Solve	• 1.Re-energize LiftOne.
	• 2.«EEPROM CRC ERROR» will be displayed on LCD.
	• 3.Press «ENT» button and reset faulty parameters to factory default values.
	• 4.Re-enter parameter values.
	• 5.If this error occurs again, LS-MAIN board has to be repaired.
• **ERROR DISPLAY NAME**	• **26. PHASE LOSS**
• Reason	• One or more phase is lost from main 3P grid power.
• Result	• LiftOne inhibits further operation until all phases deliver power.
• How to Solve	• Make sure grid power is disconnected from LiftOne and check R-S-T-N terminals on LS-MAIN for connection.
	• Make sure grid power is disconnected from LiftOne and check L1-L2-L3 terminals on LiftOne for connection.
• **ERROR DISPLAY NAME**	• **27. PHASE SEQUENCE**
• Reason	• 3P Power connected to R-S-T-N terminals are not in correct order.
• Result	• LiftOne inhibits further operation until phases are connected in correct order.
• How to Solve	• 1.Make sure grid power is disconnected from LiftOne.
	• 2.Swapp two of the phases connection to LiftOne's main power supply terminals. (MR Type = bottom terminals

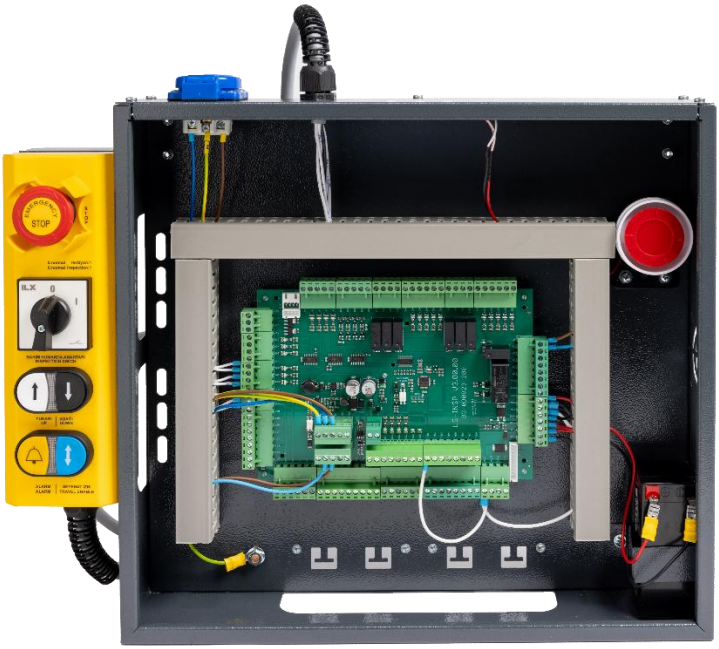
	of FCF, MRL Type = bottom terminals of SCF)
• **ERROR DISPLAY NAME**	• **28. LOW VOLTAGE ERROR**
• Reason	• SMPS output voltage is below 20v DC. (Measured from GND – 24V terminals)
• Result	• LiftOne inhibits further operation.
• How to Solve	• 1.Measure voltage from GND and L24V terminals on LS-MAIN.
	• 2.If any other device connected to 24v DC supply, remove them one by one to find faulty device.
	• 3.SMPS replacement is required.
• **ERROR DISPLAY NAME**	• **29. STOP ERROR**
• Reason	• The stop circuit was interrupted.
• Result	• LiftOne inhibits further operation until stop circuit is complete again.
• How to Solve	• Check emergency switches and contacts. «120» LED's should be light up on LS-MAIN.
	• Check wiring of the terminal block 120 on LS-MAIN.

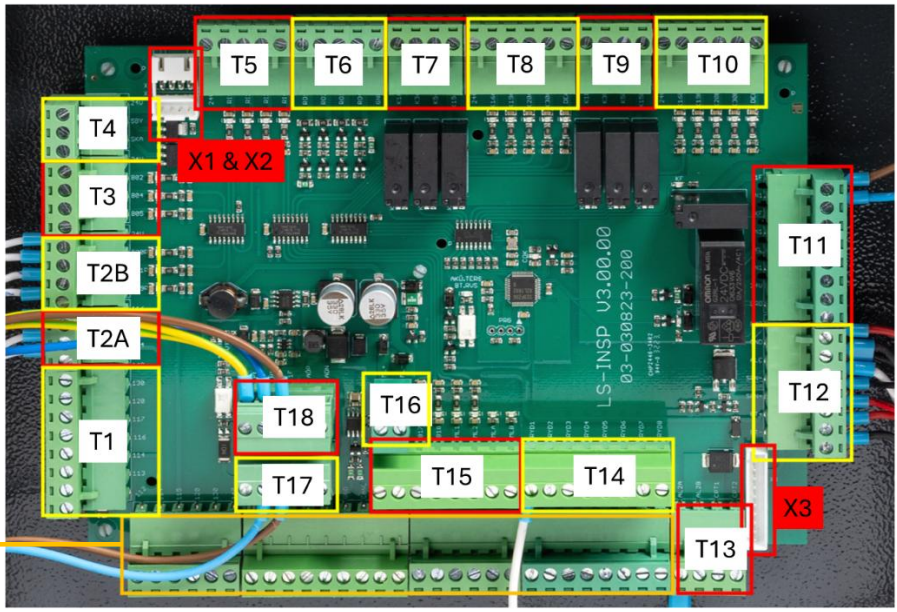
9 Auxiliary Device

LS Automation Solutions provides auxiliary device regarding LiftOne.

9.1 Car Top Box (= Inspection Box)

This car top box will be installed in the top of the cabin.





Name Tag	Description
Bottom Terminals	Connected to related terminals with same names to LS-Main in LiftOne
T1	
112	42v AC Safety Circuit Output
113	Car Brake Gear Contact 42v AC Input
114	Loose Rope Contact 42v AC Input
116	42v AC Safety Circuit Output
117	42v AC Safety Circuit Input
120	Car Roof Hatch Contact 42v AC Input
130	42v AC Safety Circuit Output
140	Car Door Contact 42v AC Input
T2A	
114	42v AC Safety Circuit Output
115	42v AC Safety Circuit Output
116	42v AC Safety Circuit For Inspection Operation Input
T2B	
869R	Inspection Mode Input 24v DC
501R	Travel Up Button Input 24v DC
500R	Travel Down Button Input 24v DC
24V	24v DC Output
T3	
805	Full Load Contact Input 24v DC

Name Tag	Description
804	Over Load Contact Input 24v DC
802	Minimum Load Contact Input 24v DC
24V	24v DC Output
T4	
SKA	By-pass Buzzer 24v DC- Output
SBY	By-pass Lamp 24v DC- Output
24V	24v DC Output
X1 & X2	
X1	CAN Bus Port
X2	CAN Bus Port
T5	
24V	24v DC Output
RI1-RI4	Reserved Inputs
T6	
R01-R04	Reserved Inputs
GND	24v DC- Output
T7	
K1A	Door Nuding Signal Output (Relay)
K3A	Door Close Signal Output (Relay)
K5A	Door Open Signal Output (Relay)
K15A	COM Port for K1-3-5A Outputs
T8	

Name Tag	Description
24V	24v DC Output
K16A	Door Open Status Input 24v DC+
K19A	Door Closed Status Input 24v DC+
K20A	N.C.
K30A	Door Re-Open Command Input 24v DC+ (Photocell)
DEA	Door Error Status Input 24v DC+
T9	
Same Input order as T7 for DoorB	
T10	
Same Input order as T8 for DoorB	
T11	
1F	220v AC Phase Input
N1	220v AC Neutral Input
KF	220v AC Phase to Car Fan Motor
N1	220v AC Neutral to Car Fan Motor
KL	220v AC Phase to Car Lamp
N1	220v AC Neutral to Car Lamp
24V	24v DC+ Output for LR Relay
LRO	24v DC- Output for LR Relay

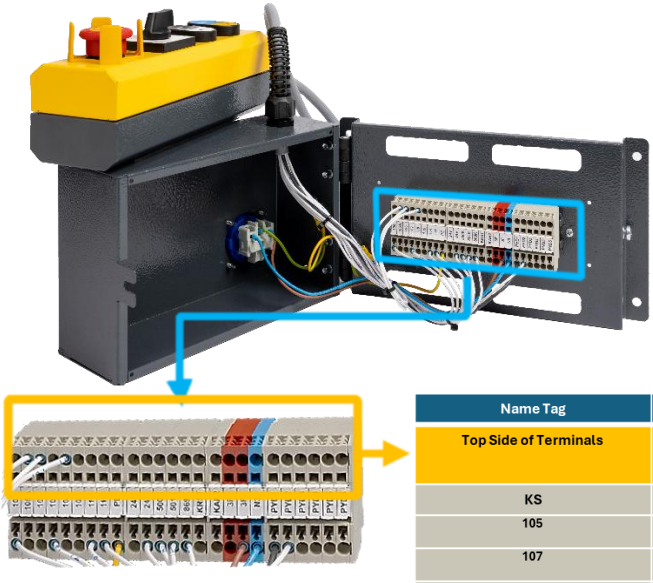
Name Tag	Description
Bottom Terminals	Connected to related terminals with same names to LS-Main in LiftOne
T12	
EMG	24v DC+ Output for Emergency Cabin and Top of Cabin Illumination
GND	24v DC- Output
ALC	Alarm Button Input 24v DC-
SRN-	Siren Output 24v DC-
SRN+	Siren Output 24v DC+
BT+	Battery Connection 12v DC+
BT-	Battery Connection 12v DC-
X3	
X3	LS-SC16 COP Board CAN Bus Port
T13	
AL2A	Alarm Button Input 24v DC-
AL2B	N.C.
CPT1	N.C.
CPT2	N.C.
T14	
RYD1	Alarm Button Input 24v DC-
RYD2-RYD8	Reserved For Intercom/Alarm Device Connection (Directed to LS-MAIN)

Name Tag	Description
T15	
24V	24v DC+ Output
24V	24v DC+ Output
817	Bottom Forced Slowdown Input 24v DC+ Input
818	Top Forced Slowdown Input 24v DC+ Input
ML1	ML1 Input 24v DC+ Input
ML2	ML2 Input 24v DC+ Input
MLA	MLA Input 24v DC+ Input
MLB	MLB Input 24v DC+ Input
T16	
ML+	24v DC+ Output
ML-	24v DC- Output
T17	
PE	
N1	220v AC Neutral Output to N1 on T11
1F	220v AC Phase Output to 1F on T11
ADP	220v AC Phase to Photocell
ADN	220v AC Neutral to Photocell

Name Tag	Description
T18	
PE	Earth to 220v AC Plug on Inspection Box
N1	Neutral to 220v AC Plug on Inspection Box
1F	Phase to 220v AC Plug on Inspection Box
ADP	220v AC Phase to Photocell
ADN	220v AC Neutral to Photocell

9.2 Shaft Pit Box

This shaft pit box will be installed in bottom of the shaft.



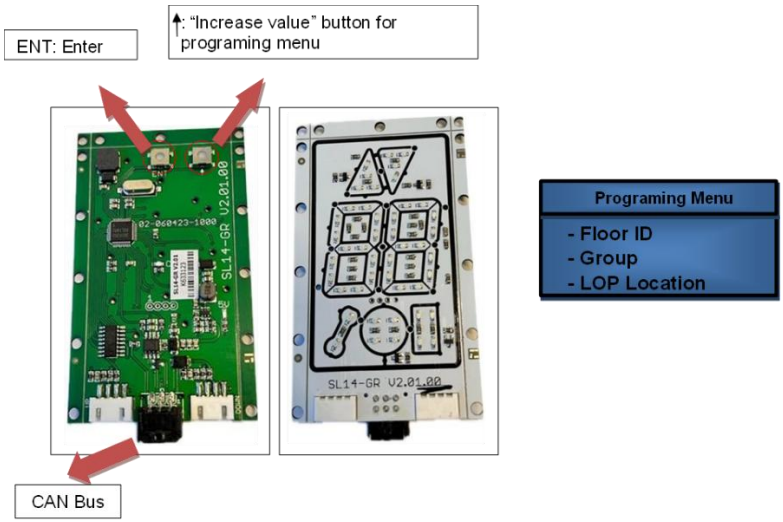
Name Tag	Description
Top Side of Terminals	Connected to related terminals with same names to LS-Main in LiftOne
KS	U-V-W Shorting Contactor
105	Safety circuit beginnig node for shaft pit (42v AC) OUTPUT
107	Safety Circuit Node for Inspection Switch at shaft pit box (42v AC) OUTPUT
109	Safety circuit nodes "Car Buffer","Counter-weight Buffer" and "Lower Limit" contact. (42v AC) Input
114	Safety Circuit Node for Inspection Switch at shaft pit box (42v AC) OUTPUT
115	Safety Circuit Node for Inspection Switch at shaft pit box (42v AC) INPUT
PE	Earth
24V	24v DC Output
500K	Shaft Pit Inspection Move Down Button Input
501K	Shaft Pit Inspection Move Up Button Input
869K	Shaft Pit Inspection Mode Enable Input
KRST	Shaft Pit Inspection Reset Input
KAR2	Shaft Pit Illumination Button (220v AC Phase) Input
3F	Shaft Pit Illumination Supply (220v AC Phase) OUTPUT
N3	Shaft Pit Illumination Supply (220v AC Neutral) OUTPUT
PYD1	0v DC Output
PYD2	Shaft Pit Alarm Button (0v DC) Input
PYD3	Reserved
PYD4	Reserved
PYD5	Reserved
PYD6	Reserved

9.3 SL Series Serial Communication LOP Boards

9.3.1 Serial Communication Board with integrated 7-Segment Display

SL14-GR LOP Board

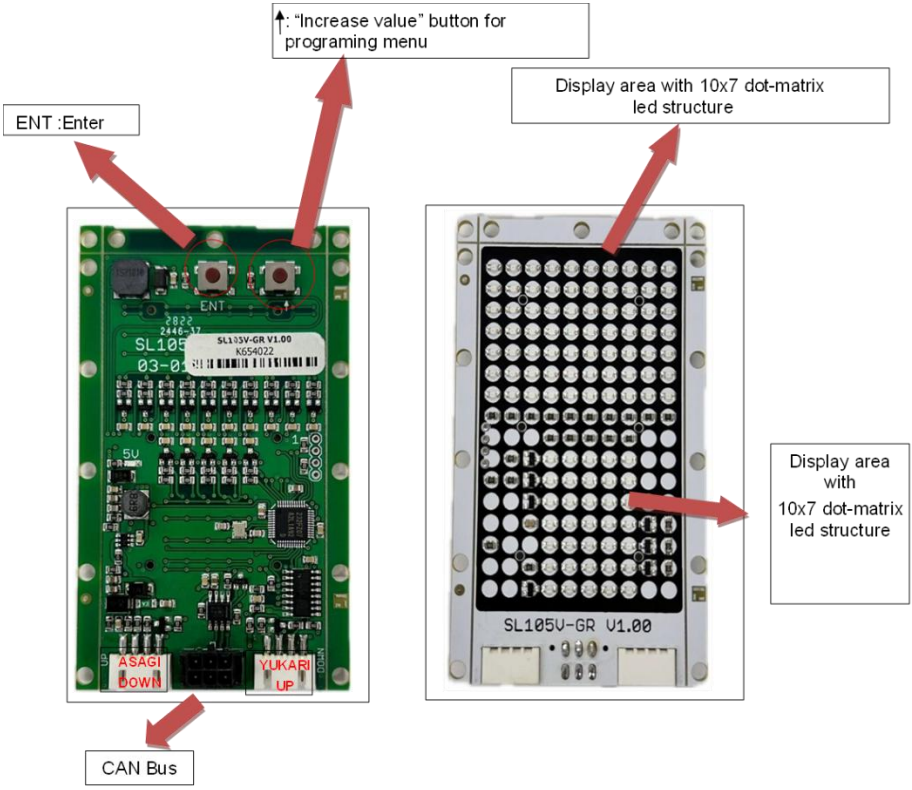
SL14-GR is a LOP board with an integrated 2x7 segment structure led indicator. The integrated indicator can display up-down arrows, 2-digit floor information, out-of-service symbol, maintenance symbol and busy symbol.



9.3.2 Serial Communication Board with integrated Dot-Matrix Display

SL105V-GR LOP Board

SL105V-GR is a LOP board with two integrated dot-matrix structures (5x7 + 10x7) led indicator. The integrated indicator can display up-down arrows, 2-digit floor information, out-of-service symbol, maintenance symbol and busy symbol.

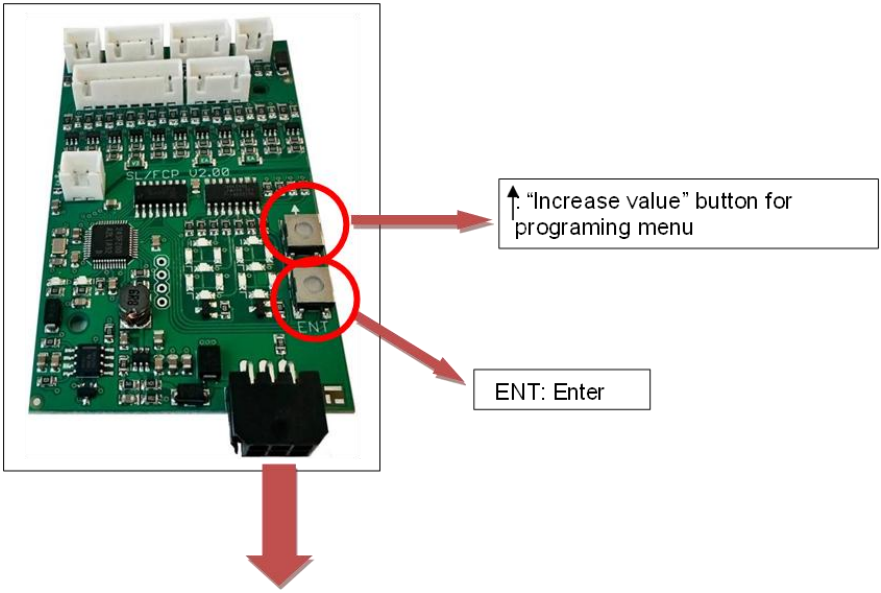


9.3.3 Serial Communication Board without integrated Display

SL-FCP LOP Board

SL-FCP is a LOP board with a gray/binary I/O to connect an external display.

Attention: There is no integrated buzzer on the SL-FCP. Buzzer can be externally connected.

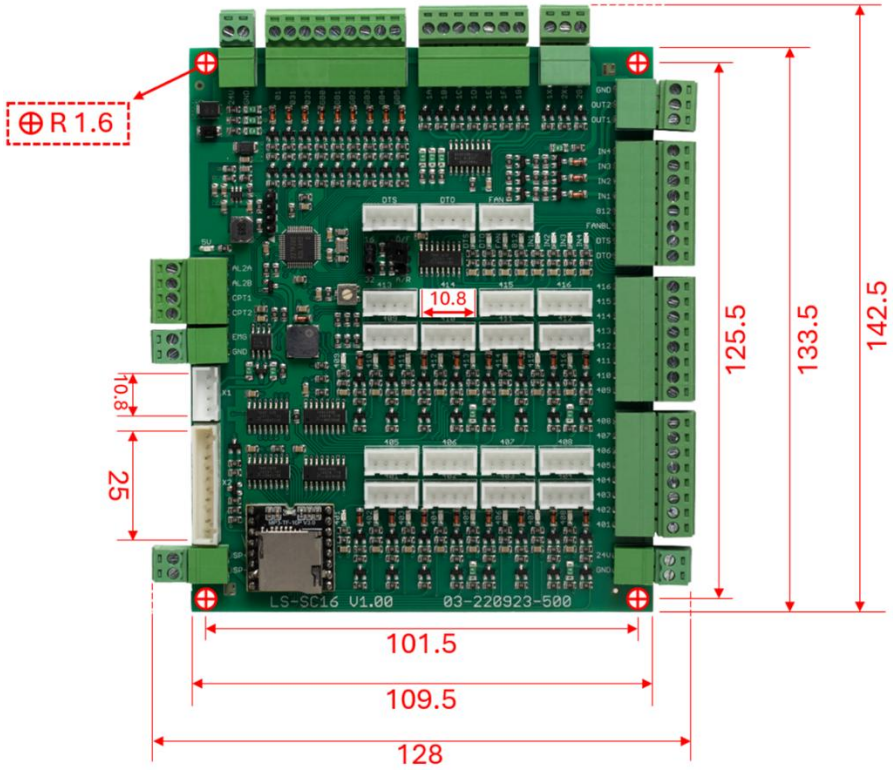


For more details, please refer to LiftOne Serial LOP Manual.

9.4 COP Connection Board

LS-SC16

LS-SC16 is a connection board that is connected to the LS-INSP revision board with a single cable and can work with both serial-communication and parallel-connected COPs. It can be configured up to 16 stops in a single-board configuration, and up to 32 stops with two-board configuration. The connections, inputs and outputs on the board are as follows.

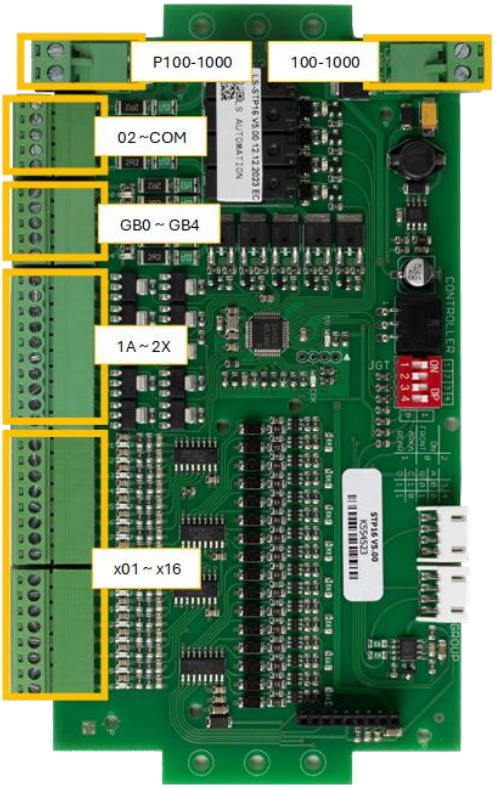


For more details, please refer to LS-SC16 Manual.

9.5 Parallel LOP Connection Board

STP-16 (and I/O-16 board)

STP-16 is a LOP connection board that is connected to the LS-MAIN elevator controller board with a single cable and supports up-to 16 stops for single button LOP configurations or up-to 9 stops for double button LOP configurations. This can be extended by using the I/O-16 extension board. STP-16 + I/O-16 combination supports up-to 32 stops for single button LOP configurations or up-to 17 stops for double button LOP configurations.



For more details, please refer to STP-16 Manual.

End of document